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SOCIAL ANALYSIS MODEL

FOR

THE SANTA FE NATIONAL FOREST

Clyde Eastman and James R. Gray

SOCIAL ANALYSIS MODEL

FOR THE SANTA FE NATIONAL FOREST

by

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and

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for

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INTRODUCTION

Increases in population density intensify the problems of resource management. When a few small bands of Indians hunted through the mountains of northern New Mexico few rules were necessary. They used what they needed as they moved. By the time Spanish settlers joined the Pueblos in the irrigated valleys, a complex set of rules were required to govern man's relations to the land which supported him. Today, even though only a small percentage of the population is directly dependent on public lands, many others wish to use them to enhance the quality of their lives. When populations grow (and they promise to continue growing rapidly), the competition for land and forest resources will certainly intensify. As this competition increases, the management of public land resources will become at once more difficult and more important. There are no magic prescriptions to make reconciliation easier among competing interests. However, there are ways to rationalize the criteria and to make the decision process more responsive to the social needs of those who use the Forest.

The Santa Fe National Forest has been designated as the lead forest in Region Three (Arizona and New Mexico) to develop an integrated Land Management Plan. Essential to that planning process is a Social Analysis Model to enable assessment of the social impacts of alternative allocation of forest resources. This report documents the development of a Social Analysis Model and illustrates application of the model with two examples of resource allocation.

The specific purpose of this study was to design a simple accurate Social Analysis Model based on existing data which could be used by non-social scientists. It should permit a reasonably comprehensive, yet concise assessment of the social impacts resulting from forest management decisions. To be useful, community impacts were summarized into a small number of Relevant Social Dimensions, RSD's.

Two important assumptions, which we believe are quite realistic, constrain the model. First, we assume that there will be no abrupt shifts in resource allocations which could result in 'boom' or 'bust' situations in any of the impacted communities. 'Boom/bust' conditions, e.g., from large-scale mining developments, create unique sets of problems for the impacted communities. For instance, there is considerable disruption of established community activity, and services cannot be expanded when there is rapid population turnover not associated with more stable communities. It is difficult to foresee any such 'boom' or 'bust' situation resulting from resources under the direct control of the Forest Service.

The second assumption is that the Indian Pueblos will not exert any new pressures on forest resources. Pressures will continue to mount as the Indian populations increase on their fixed reservation land base. However, that pressure is more apt to be focused on urban employment opportunities than on the surrounding rural area.

THE IMPACTED COMMUNITIES

Delineation of Impacted Communities

The communities which will be most directly affected by resource allocation decisions on the Santa Fe National Forest are Española, Santa Fe (including Los Alamos), Las Vegas and Albuquerque and one quasi-community, (Cuba). (Cuba) is enclosed in brackets to emphasize that it is not a community in the same sense that the others are. This is because (Cuba) is too small with too few services to be as self-sufficient as the other communities. A greater portion of its residents travel outside its boundaries to obtain essential services on a regular basis. In addition to the communities, three Locality Areas, Coyote-Gallina, Pecos and Jemez Springs were identified. These Locality Areas are inordinately dependent on Forest resources and therefore are inordinately impacted by Forest policies. For these very practical reasons, impacts on them are examined albeit in much less detail than is possible in the more autonomous communities (see Appendix A for a more detailed sociological rationale for community delineation).

Most of the primary impacts of resource utilization will fall on the population living in the vicinity of the Forest, i.e. those living close enough to visit it weekly or more frequently. There are two sub-sectors of this population with distinct sets of interests. The first group consists of people who recreate in the Forest on a fairly regular basis. They may have a cabin in Jemez, backpack in the Pecos or they may fish or hike or picnic anywhere in the Forest. If they cut firewood, the fresh air and exercise will probably be as important to them as the economic value

of the wood. This sub-sector is concentrated in Albuquerque, Los Alamos and Santa Fe. The Forest substantially enhances the quality of life of residents of the larger urban communities who desire activities in green or mountainous areas. The frequency of visits by this group results in a proprietary interest in forest management decisions and resource uses.

The second group has what might be described as a socioeconomic interest in the Forest. Members of this group depend on the Forest for direct economic benefits. They may work in the timber industry, graze cattle, operate a service business, or cut poles, posts and/or firewood for their own economic benefits. These people also derive a sense of social well-being from the Forest as they picnic, gather piñon nuts and cut the family Christmas tree. Community pasture and woodlands were an integral part of the socioeconomic fabric of northern New Mexico during Spanish times. Several generations of Federal administration could not erase the cultural importance of these lands to the villagers of the region. This sub-sector of the impacted population is concentrated in small villages and rural areas which compose the (Cuba), Española, Las Vegas and Santa Fe community areas.

It is recognized that important impacts flow outside the immediate regions, i.e., to recreationists from the Texas Panhandle and elsewhere. However, the impacts on these people are substantially less direct and pervasive. Their visits occur on a less regular basis and could be shifted with relative ease to alternative areas. Economic benefits are comparatively minor. Adequate estimation of these benefits would require a block of resources well beyond the scope of the present planning effort.

Communities and Ranger Districts

Because the Forest is administered by Ranger Districts and the impacts are assessed by communities, it was necessary to merge the maps. Ranger District activities were assigned to one or more communities according to the following procedure.

The Las Vegas Community Area encompassed all of the Las Vegas Ranger District (Figure 1). The Santa Fe Community Area encompassed all of the Pecos and Tesuque Ranger Districts with the Pecos Locality Area conciding with the Pecos Ranger District. The Española Community Area included all of the Española Ranger District and the eastern 70 percent of the Coyote District; the latter portion coincides with the Gallina-Coyote Locality Area. The western 30 percent of the Coyote Ranger District was included in the (Cuba) Community Area, along with 80 percent of the Cuba Ranger District. The western part of the Coyote District was included in the Cuba Community Area because residents of this portion of the District tended to shop and seek community services in the (Cuba) Community Area.

Lastly, all of the Jemez District was included in the Jemez Locality Area and the Albuquerque Community Area. Also, 20 percent of the (Cuba) District (the southern portion) was included in the Bernalillo Community Area based on traffic flows from Albuquerque into these Ranger Districts. Boundaries of impacted communities outside of the Santa Fe National Forest extended mostly to county lines.

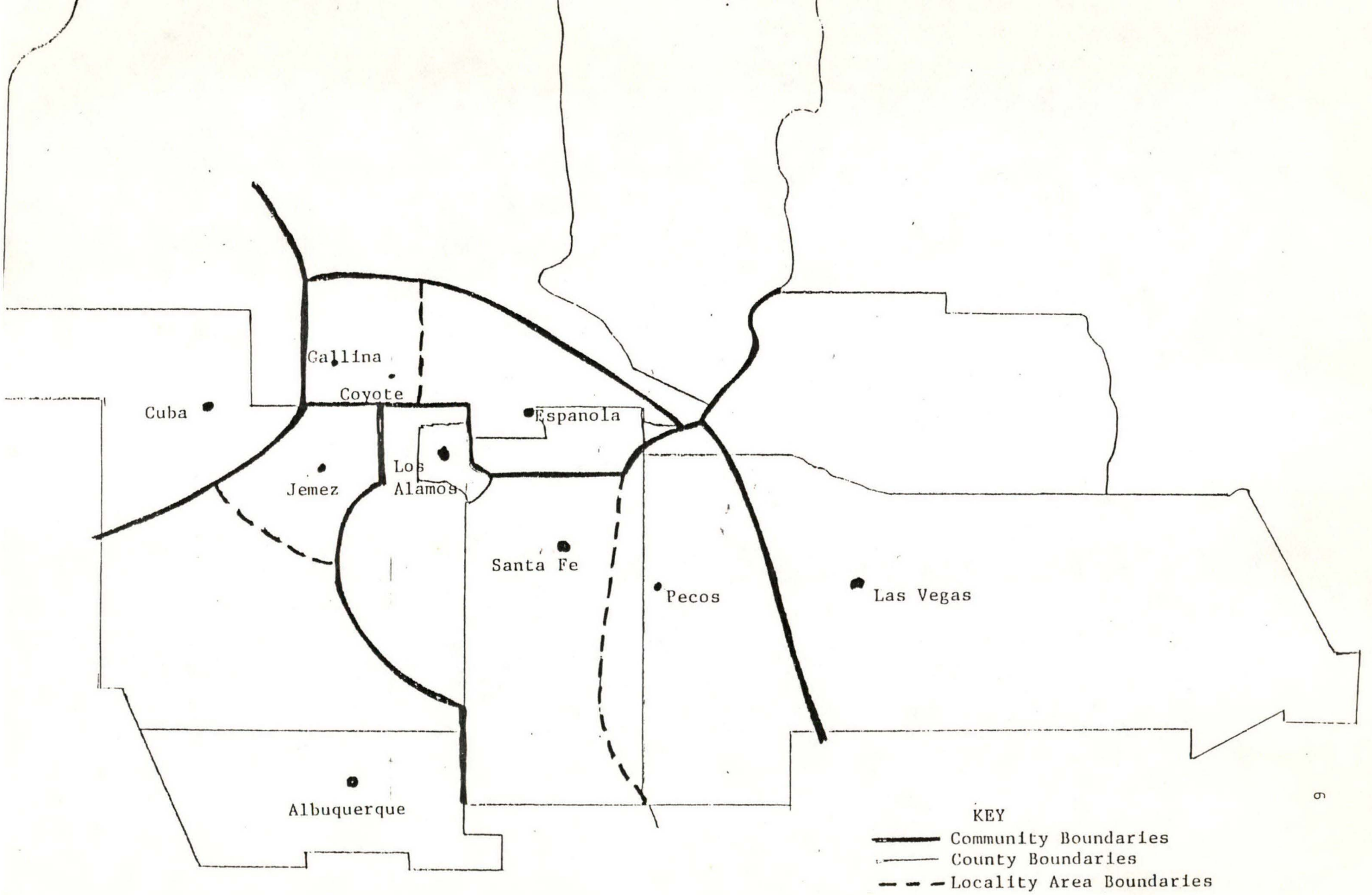
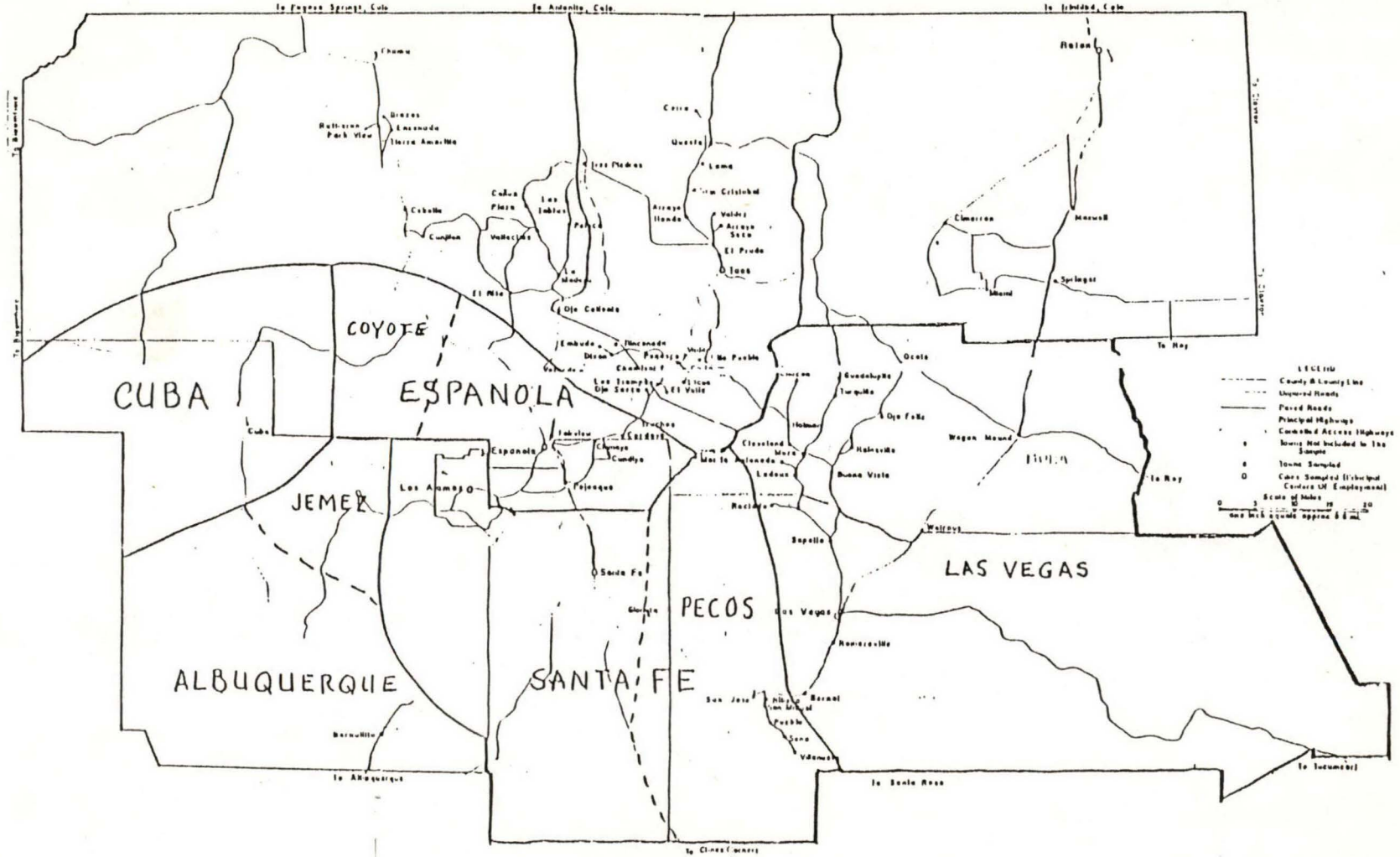


Figure 1. Community and Locality Area Boundaries, Northcentral New Mexico

North-Central New Mexico



ECONOMIC BASE DATA

The economic base data for 1977 as well as two alternative resource allocation scenarios and two projections to 1980 and 1990 for the Santa Fe National Forest were based on: a) a seven-county input-output (I-O) model of north-central New Mexico; b) two alternative resource scenarios for the Santa Fe National Forest; and, c) moderate projections for each of the affected counties to 1980 and 1990.

Input-Output Model

Populations were determined for each community and locality area, using procedures detailed in Appendix B. A seven-county input-output model developed by the Forest Service was employed to reflect final demand, gross output, employment, income, value-added and Type I output multipliers for each of the four major community areas for 1977. Adjustments were made in two of the 22 sectors of the model to more nearly reflect Type I output multipliers for the livestock enterprise and other agriculture sectors.

Changes in population were used as indices to project changes in employment in 1980 and 1990. For these two periods, coefficients of gross output, final demand and value-added were estimated from total employment and total income in each sector. Step-by-step procedures also are detailed in Appendix B.

Alternative Resource Scenarios

Two scenarios were prepared by the Forest Service to represent a) an extreme change in resource uses in the various ranger districts of the Santa Fe National Forest and b) likely changes in resource uses in the various ranger districts. Sixteen resource uses were included in the changes, although some uses remained unchanged in some districts (Appendix

The quantities of uses were programmed through the 1977 I-O model and changes were estimated in the final demands for some sectors, e.g., changes in timber harvest affected final demands in the logging and sawmill sectors (Appendix Table 3). Changes in final demand for affected sectors in each ranger district were allocated to each community area, resulting in new final demand totals in some of the 22 sectors in the four community areas.

Once final demand totals were determined for each sector of each community area, coefficients were used to estimate gross output and income. Average earnings per employed person in each sector were used to estimate employment from income totals.

Results of the above procedures were summarized for all sectors in terms of final demand, total or gross output, total income and total employment (Appendix Tables 4 to 7). The latter three indicators -- gross output, job income, and employment -- became the prime factors to to be used in measuring social impacts of alternative resource allocations.

Socioeconomic Profiles

Population data for the communities and locality areas are presented in Table 1. Much of the relevant local socioeconomic data is compiled by counties which do not necessarily correspond to natural community boundaries. Nevertheless these data do provide valuable insights into the social structure of the communities which surround the Forest.

Los Alamos heads the list on most socioeconomic attributes (Table 2). It has the highest per capita income, lowest unemployment rate, fewest food stamp recipients, lowest housing density, infant mortality and suicide rate and highest educational level and voter turnout. Bernalillo and Santa Fe Counties, with the exception of high crime rates, generally stand in an intermediate position in all of the socioeconomic attributes, below Las Alamos but ahead of the more rural counties. The rural counties, Mora,

Table 1. Estimated Population by Community Area, Santa Fe National Forest Social Impact Study, 1977, 1980 and 1990.

Community Areas (Locality Areas)	Estimated Population In: 1977	1980	1990
	----------Number----------		
Las Vegas	24,617	26,037	31,039
Santa Fe	83,877	90,073	111,719
(Pecos)	(2,242)	(2,580)	(3,107)
(Los Alamos)	(17,100)	(18,600)	(24,100)
Española	14,745	15,014	16,946
(Coyote)	(1,520)	(1,755)	(1,947)
Cuba	6,485	8,063	10,001
Albuquerque	377,900	433,299	536,660
(Jemez)	(1,715)	(2,187)	(2,840)
	----------Index (1977 = 100)----------		
Las Vegas	100	105.0	126.1
Santa Fe	100	107.4	133.2
(Pecos)	100	115.1	138.6
(Los Alamos)	100	108.8	140.9
Española	100	101.8	114.9
(Coyote)	100	115.5	128.1
Cuba	100	124.3	154.2
Albuquerque	100	114.7	142.0
(Jemez)	100	127.5	165.6

Table 2. Socioeconomic Profile of Counties Directly Impacted by the Santa Fe National Forest, Santa Fe National Forest Social Impact Study.

Characteristic / County	Bernalillo	Los Alamos	Mora	Rio Arriba	Sandoval	San Miguel	Santa Fe
Economic							
Income ($ Per Capita, 1974)	4,139[2]	7,011	2,081	2,786	([2])	2,786	4,639
Unemployment Rate	6.2[2]	3.8	29.8	17.3	([2])	8.8	6.6
Recipients of Food Stamps[1] (%)	10.04	0.0	37.39	27.74	21.85	28.64	16.91
Women in Work Force[3]	38.3[2]	31.5	22.3	34.0	([2])	37.2	39.3
Demographic							
Housing Density[4] (%)	9.7	5.4	19.7	25.0	30.7	16.2	15.5
Over Age 65[1] (%)	6.1	2.1	11.9	7.4	7.2	9.9	7.8
Median Age (yrs)	24.4	26.7	22.6	21.0	21.3	23.4	24.8
Spanish Americans[1] (%)	39.1	17.7	94.6	82.2	21.0	81.7	64.9
Native Americans[1] (%)	7.2	0.5	0.1	10.9	38.9	0.4	2.0
Health and Safety							
Doctors (Persons per)	419	612	na	1241	2850	885	621
Infant Mortality[5]	11.9	5.4	na	18.2	5.6	15.4	9.8
Suicides (per 100,000)[6]	18.1	8.5	17.7	24.8	29.9	15.8	20.4
Police Officers (per 1,000)	1.6	2.1	1.2	2.8	1.2	1.8	1.8
Serious Crimes (per 1,000)	81	30	12	26	20	70	73
Education							
Median (yrs)[7]	12.5	14.2	8.2	9.7	10.3	9.1	12.3
Four Years of College (%)[7]	16.9	38.6	4.0	5.7	9.5	10.3	16.5
Voter Turnout, 1976 (%)[8]	80.0	85.6	74.6	74.2	77.3	79.2	80.9

[1] Percent of total population.

[2] Included in the Albuquerque SMSA.

[3] Females as a percent of the total labor force.

[4] Percent of total units with 1.01 or more persons per room.

[5] Per 1,000 live births.

[6] c.f. Leo Yates and Byron R. King, New Mexico Cooperative Extension Service Information Sheet (six year average 1971-76).

[7] Calculated on the basis of population over 25 yrs of age.

[8] Percent of registered voters who voted for president in 1976.

Rio Arriba and San Miguel generally have the least desirable set of indicators. Income is low, unemployment and food stamp participation is high; there are fewer doctors, lower education levels, higher housing density and infant mortality.

Sandoval County, which is part of the Albuquerque Standard Metropolitan Statistical Area (SMSA) and has much of its population concentrated in the suburban fringe, has statistics remarkably similar to the rural counties. (Cuba), the quasi-community of interest in Sandoval County, is located at some distance from the urban population concentration. In contrast to the rest of the county (Cuba) is a predominantly Spanish-American community.

The Gallina - Coyote Locality Area is the most isolated of all the populations impacted by the Forest. For that reason it is the most dependent on Forest policy; it is also the most vulnerable and has the fewest economic alternatives. The Jemez and Pecos Locality Areas, while somewhat isolated, are also two of the most important conduit points to the Forest. Jemez Springs is the closest entry point to Albuquerque and constitutes the major gateway for the metropolitan population. Pecos, located on Interstate 25, is the gateway to the Pecos wilderness area.

Budget data for the communities and two locality areas and revenues and expenditures for 1976-77 are presented in Appendix Tables 8 and 9. The budget data outline the sources of revenues and the government services which they support. Very prominent in the general tax fund are gasoline and gross receipt taxes. Any activity which stimulates gross receipts or gasoline sales will tend to increase tax revenues and the support base for public services.

SOCIAL ANALYSIS MODEL

This model for social impact assessment is based on a well-established social systems framework. A schematic overview of the model is presented in Figure 2. The model has three sets of components - inputs, the social structure and impacts. A continuous stream of inputs are articulated by the social structure to produce outcomes or impacts. A National Forest engages in a variety of activities including timber harvest, grazing, recreation, wildlife management and many others. The activities from the Forest generate inputs to the social structure which are articulated through various economic and recreational endeavors to produce income and recreation experiences. Many other inputs are being received and articulated by the social structure simultaneously with those activities in the Forest. For the purposes of social impact assessment all of the other inputs, with the exception of population change, are assumed to be constant for any given point in time. This keeps the undertaking manageable.

Inputs

This analysis focuses on four major categories of Forest products.[1] These categories are timber, grazing, recreation and wildlife. While the Forest manages other important resources, the level of production is less directly under Forest Service control. For example, water yield could be altered only by very significant changes in vegatative cover and certain uses, while mining activities are governed

[1] Forest products are outputs in terms of logs, forage, wildlife and recreation space. They became the inputs to social structure and are the basis for estimation of impacts.

Figure 2. Schematic Outline of the Social Analysis Model, Santa Fe National Forest Social Impact Study.

INPUTS	Articulated by	SOCIAL STRUCTURE	To yield	SOCIAL IMPACTS	
I. Ongoing National Forest Activities		Community Socioeconomic Profiles		I. Client Services	II. Community RSD's
1. Timber		1. Municipal Revenues and Expenditures		1. Picnicking	1. Cultural Compatibility
2. Grazing		2. Economic Indicators		2. Camping	2. Service Support
3. Recreation		3. Demography		3. Skiing	3. Service Differentiation
4. Wildlife		4. Health and Safety		4. Water Based	4. Benefit Distribution
5. Other		5. Education		5. Dispersed (Motorized)	5. Community Solidarity
II. Changes		6. Voting Behavior		6. Dispersed (Non-motor)	6. Social Participation
1. Population Growth (Estimated)				7. Big Game Hunting	
2. Resource Allocations (Estimated Additional Jobs, Income and Gross Receipts for I-O Analysis)				8. Small Game Hunting	
				9. Non-hunting Wildlife	
				10. Fishing	
				11. Grazing	
				12. Woodcutting	

by regulations established external to the Forest. Therefore, the model focuses on those resources over which the Forest has the most discretion and control.

As was reported previously, two scenarios of alternative resource allocations were developed and processed through a standard I-O format to estimate the corresponding changes in jobs, income and gross receipts. The job income and gross receipts form the basis of the community RSD's as they are articulated by the social structure.

Social Structure

The socioeconomic profiles of the impacted communities provide a partial background for understanding how the social structure articulates. Familiarity with the communities compliments, or rounds out, the necessary background. A number of Forest personnel are, perhaps without realizing it, very well-informed on the local social structure. This expertise stems from years of living in and working with the various communities. The social data may not be systematically collected or stored anywhere. However, questions such as who uses the Forest, where do they enter the Forest, how often, with what expectations and what are the complaints, can be answered by them. Similarly the political and social interactions within communities are well understood. There is no precise formula such as the I-O model by which social articulation can be calculated. Nonetheless articulations can be traced and/or estimated with a fair amount of precision and reliability. The Social Impact Model provides a technique to systematically assess impacts of Forest management decisions on nearby human populations.

Client Services

The most direct, the most obvious and probably the most easily appreciated social impacts of a National Forest are client services. What do Forest visitors do and what do they receive? They hunt, fish or enjoy the wildlife, they camp, hike or picnic, they graze livestock and they cut wood. All wildlife and non-wildlife based recreation contributes to the participants' social well-being. They engage in these activities because they are pleasurable. By any definition their activities constitute social benefits.

Livestock grazing and woodcutting are less obvious; in many cases they fall on a continuum between purely economic and purely social benefits. Some people probably cut fuel wood in the Forest because wood is the only heating or cooking fuel they can afford. Many more cut it for an aesthetic fireplace and because they enjoy the outdoor exercise. For the people who seek aesthetic benefits the economic value of the wood is a secondary consideration. In a similar vein they annually trek to the Forest to cut the family Christmas tree.

However, when cattle are grazed in 50 or 100 cow units, both intent and impact are primarily economic. When cattle are grazed in two or five cow units the cultural value of livestock production dominates the economic value. Many descendents from agricultural families feel more comfortable and 'socially secure' owning a few head of livestock. They take pride in animal ownership; they enjoy caring for animals and at least part of their food supply seems a little more secure.

Any attempt to artificially reduce social impacts associated with the foregoing activities to a common denominator was deliberately avoided.

Picnicking, wilderness camping and cutting Christmas trees are all forms of recreation. Few hikers bent on a wilderness experience are going to be satisfied with a vacant picnic table or a nice Christmas tree. Therefore, there would appear to be little validity in reducing products and experiences to a common denominator. The Forest may or may not have a reasonable prospect of satisfying the active and latent demand for its services. In most recreation activities, e.g., picnicking, hiking, or camping, it probably can expect to meet almost all the demand. Wildlife and wilderness based recreation is more problematic. The demand for grazing may always outstrip the capacity.

Cultural Compatibility

Cultural Compatibility of a Forest resource allocation can be assessed qualitatively according to one definite criterion. It was pointed out above that there are two sub-sectors of impacted populations; the recreationist and the resident-user. Recreationists are from Albuquerque, Los Alamos and Santa Fe. As could be seen in the social profiles, this group as a whole are predominantly Anglo. Beyond that, the recreation patterns of these urbanites are not likely to be highly culturally differentiated. Urban recreationists seek pretty much the same experiences irrespective of their ethnicity. Therefore, cultural compatibility would not be much of a factor in determination of recreation policies or programs.

For the second impacted sub-sector, the resident-user group concentrated in Las Vegas, Española, (Cuba), Santa Fe and the locality areas of Gallina-Coyote and Pecos, the cultural mileau is very different. These communities are predominantly Spanish-American. Anglo-American culture

and values coexists sometimes very tenuously, with strong remnants of the older Spanish-Indian culture.

In few areas are cultural differences more pronounced than in man's relation to the land. Studies have documented and verified the contrasting land attitudes.[2] In the Spanish villages irrigated farmland was privately held while pasture and woodland were held and used in common. Most villages had substantial extensions of community lands which every resident could enter to graze his animals, cut firewood, posts or poles, gather piñon nuts or to recreate. With the Anglo conquest of the region the community lands gradually passed to Federal control. The Santa Fe National Forest now encompasses some of the former community lands. The loss of community lands created some bitterness among many northern New Mexicans. They perceive the loss of land to be the prime cause of the region's economic problems. They perceive that they are poor because they lost their lands, in part to large landowners and in part to the government. Recovery of the lost lands was the rallying cry of the Reies Lopez Tijerina's Alianza in the late 1960's. The perception and resentment continues strong even among the younger generation.

To evaluate the cultural compatibility, the general criterion of accessibility can be employed. Local residents generally perceive as infringement on the traditional culture anything which limits or constrains access to the Forest. This includes actual or perceived access to graze livestock, cut firewood, posts, poles, etc., gather piñon nuts, hunt, fish or any other traditional use. This feeling transcends a recognition of

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[2] See, Clark S. Knowlton "Conflicting Attitudes Toward Land Use and Land Ownership in New Mexico." Proceedings of the Southwestern Sociological Association, Vol. XVII, Dallas 1967, pp. 60-68. Also Clyde Eastman, et al, Evaluation of Attitudes Toward Land, Experiment Station Bulletin 577, May 1971.

the requirements for good resource management and provides only a sometimes grudging recognition that other citizens - outsiders - also have some Forest use rights. A particularly dim view is taken of recreation developments which cater to out-of-state visitors.

One further comment is in order at this point. There is an inordinate affinity for livestock among the residents of the region. This is not uncommon among people with recent agrarian antecedents. They feel incomplete, vaguely insecure, almost unfulfilled without a few animals. This may be true of many with good incomes from non-agrarian sources. What may appear at first observation to be an almost irrational desire for livestock and a place to graze them is indeed a pervasive and not uncommon cultural heritage. Anything which reduces livestock grazing is particularly incompatible to the traditional village culture.

Benefit Distribution

A frequent lament of community leaders concerning new industry is that it creates a few low paying unskilled jobs which do not offer that much opportunity. This is an all-too-common perception, whether actual or unreal. For this reason and for reasons of equity, distribution of jobs and income is an important facet of social impact assessment.

The I-O analysis indicates changes in the number of jobs and the amount of personal income by sectors for alternative resource allocations. Table 3 shows how incomes are distributed within each economic sector. The distribution of changes in numbers of jobs within any sector can also be estimated. Generally speaking, the more even the distribution of incomes within a sector and the higher the average income,

Table 3. Distribution of Incomes by Major Sectors, Santa Fe National Forest Social Impact Study, 1977.

Sector	$1 - 3,999	$4,000- 7,999	$8,000- 9,999	$10,000- 11,999	$12,000- 13,999	$14,000- 15,999	$16,000- 19,999	$20,000- 29,999	$30,000 & over	Total	Average[1]
	percent										$
Livestock	37	36	12	8	2	2	1	1	1	100	5,750
Other Agriculture	54	30	4	3	3	3	1	1	1	100	4,740
Metal Mining	8	16	7	7	8	16	22	14	2	100	13,660
Oil and Gas	9	4	5	8	12	15	17	18	12	100	17,195
Other Mining	11	7	10	13	8	14	20	15	2	100	13,695
Construction	26	18	10	12	11	7	7	7	2	100	9,585
Food and Kindred Products	30	20	8	9	10	8	7	6	2	100	9,050
Textile and Apparel	44	24	13	4	5	4	3	2	1	100	6,115
Logging	12	42	17	15	6	4	2	2	0	100	7,630
Sawmills	25	28	13	14	8	5	5	2	0	100	7,570
Other Wood	29	25	17	12	8	5	3	1	0	100	7,005
Other Manufacturing	21	23	9	10	9	7	12	6	3	100	10,275
Transport & Warehousing	23	23	15	9	9	7	6	6	2	100	9,260
Communic. & Utilities	11	13	16	11	11	10	14	12	2	100	12,350
Wholesale Trade	20	19	13	11	11	10	8	6	2	100	10,070
Auto and Gas	34	23	9	8	7	6	6	5	2	100	8,175
Eating and Drinking	59	32	5	2	1	1	0	0	0	100	3,550
Other Retail	33	27	15	12	7	2	2	2	0	100	6,510
FIRE	25	25	19	10	7	4	3	5	2	100	8,395
Lodging	60	27	5	4	1	0	2	1	0	100	3,945
Personal Services	50	24	6	5	3	3	3	4	2	100	6,200
Other Services	25	25	24	10	5	4	3	3	1	100	7,690

[1] Midpoints of intervals used to calculate average incomes were $1,500, $5,500, $8,500, $10,500, $12,500, $14,500, $17,500, $24,000 and $40,000.

the more equitable and desirable a sector is. For example, in the sawmill sector employment, 25 percent earn less than $3,999 annually while 34 percent earn more than $10,000. In the lodging sector 60 percent earn less than $3,999 annually while only 8 percent earn more than $10,000. The average incomes in sawmills are $7,570 compared to $3,945 in lodging. Therefore sawmill employment is both more equitable and desirable than employment in lodging establishments. This is not to say that some low income unskilled jobs are not beneficial, particularly in poor communities with high unemployment rates. However, it is generally desirable to have an even skill and income distribution since this indicates opportunities for people to advance in both skill and income levels.

Within any given sector there is probably very little the Forest Service could do to enhance income equity.[3] This is determined by external technical and economic forces. It can only attempt where possible to favor those sectors with more even income distributions.

Service Support

As can be seen in the municipal budgets gross receipts and gasoline taxes are important sources of revenue (Appendix Tables 8 and 9). Generally speaking, any resource allocation which increases the gross receipts or gasoline taxes enhances the support base for public services. This is important since the occupants of new jobs also require public services, e.g, police and fire protection, sanitation, user-oriented recreation areas, etc. In scenarios of stable or slower rates of growth sources of revenue tend to keep up with service support requirements. In the abrupt spurts of growth exhibited by boomtowns, financial requirements

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[3] Of course, when ethnic inequities occur remedial actions may be undertaken and have been by most agencies. However, problems of racial and ethnic discrimination are beyond the scope of this work.

of facilities and services can greatly outstrip revenues in the short run. Boomtowns, therefore, present a unique set of problems. The assumption was made at the outset that Forest resource reallocations would be highly unlikely to occur abruptly enough to ever create either a boom or a bust situation. So long as that assumption is not violated new revenue requirements are not apt to exceed community finances.

Service Differentiation

Service differentiation is the appearance of a qualitatively new service in a community. For example, if a village establishes garbage pickup for the first time or a dry cleaning establishment opens where none existed before, then service differentiation has occurred. However, a town which has three bars is not further differentiated by the opening of a fourth bar. No new service is available. Generally speaking service differentiation is desirable. The more highly differentiated the community the more adequately it can meet the needs of its citizens and the less they must travel outside to meet their needs.

The general sequence of service differentiation, i.e. the order in which new ones appear has been established.[4] The timing of the appearance is problematic, being dependent on several factors: economic, transportation, local initiative, etc. Service differentiation is more likely to occur and to be observable in the Locality Areas and in (Cuba). Any new, even relatively unspecialized service, makes a difference. A new service in a community like Santa Fe would be very specialized and might be much less noticeable. In one particular sector - recreation - the Forest Service

[4] For example see Clyde Eastman, Robert Coppedge, and John Romanek, Development Strategy for Nonmetropolitan New Mexico - The Community Services Approach, N.M. Ag. Exp. Sta. Research Report 358, February 1978.

has the potential to directly affect service differentiation. It may have the opportunity to develop an entirely new recreation activity, e.g., designating a nature way for paraplegics or opening a handicapped citizen Nordic ski area in an area where one does not exist.

Community Solidarity and Social Participation

It would be highly desirable to assess the impact of resource allocation on community solidarity and on the level of social participation. Unfortunately the connections are less concrete and less possible to demonstrate than the foregoing RSD's. However, they are not less important for the social well-being of the residents.

Two communities, (Cuba) and Las Vegas provide contrasting examples of solidarity. (Cuba) had a remarkably high level of solidarity over a number of years. Good examples of this are the Checkerboard Health Clinic and the community swimming pool. A number of local people worked very hard to help obtain funding for both projects. (Cuba) supported a farsighted school administration which was able to anticipate expansion, to plan for and to build new up-to-date facilities in an orderly fashion. New buildings and facades give the new thoroughfare a dynamic appearance. (Cuba) generally projects a viable and progressive image.[5] Beyond that, it has translated solidarity into more concrete service differentiation.

Las Vegas, on the other hand, provided a melancholy example of a community divided unto itself. Until 1968 Las Vegas was divided into two municipalities. West Las Vegas was a Mexican-American village not

[5] Berry Ives and Clyde Eastman, Impact of Mining Development on an Isolated Rural Community: The Case of Cuba New Mexico, N.M. Ag. Exp. Sta. Research Report 301, August 1975, p. 15.

unlike many other villages in Northcentral New Mexico. East Las Vegas was the Anglo-dominated business center situated along the railroad and highway. The two halves had coexisted uneasily side by side for more than a hundred years before they finally consolidated. When citizens were queried about the benefits of consolidation in 1978, a decade after it occurred, the unanimous response was "it finally brought us together" i.e., consolidation enhanced solidarity. Other benefits were occasionally cited, but solidarity was usually cited first and it was cited by everyone.[6]

Generally, the guiding principal for assessment of solidarity is that any new activity which is controversial or which otherwise divides the community will lower solidarity and be undesirable. Similarly any new activity which requires or promotes cooperation of diverse elements enhances solidarity. Many activities probably have little or no impact on community solidarity.

Social participation, like solidarity, is somewhat elusive but it is also a very important dimension of social well-being. Social participation takes many forms: voting in elections, working for political candidates, membership in civic organizations and other forms of involvement in community activity. The guiding principal for assessment of participation is that any new activity which encourages or enhances participation is generally desirable. For example, construction workers who come into a community for a fixed period of time with the expectation of moving on usually do not contribute much to the political, religious, social or cultural life of the community. They often exist as a group of outsiders

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[6] c.f. Clyde Eastman, Garrey Carruthers and Caleb Clark, Consolidation of Municipal Government: The Case of Las Vegas, New Mexico, unpublished manuscript.

tolerated but not really appreciated by the community. Economic opportunities which attract permanent residents and encourage them to become involved may enhance the social fabric of the community. Many economic activities probably have little or no effect on social participation.

Operation of the Model

To illustrate the operation of the social impact model we now return to the alternative resource allocations. Summaries of the economic results of the alternative allocations are presented in Tables 4 and 5. The distribution of jobs by economic sector and community for each scenario is presented in Table 6. As it turns out, only seven of the 22 economic sectors realized employment gains as a result of these resource reallocations. Lumbering and retail service sectors realized the job gains. While absolute gains were greatest in Santa Fe, the changes in (Cuba) were relatively far more important. For example under scenario 1 (Cuba) would pick up 120 new jobs or a 17.7 percent increase over the 1977 number of jobs. This underscores the important role the Forest exerts on the economies of the smaller communities.

A step by step procedure for application of the model appears in Appendix D.

Cultural compatibility: The only activity which outwardly reduces access to the Forest by local residents is the reduced grazing in the Cuba and Coyote Districts in Scenario 2. Such a reallocation is apt to meet with some cultural resistance. If there were an equal number of ranchers in the Pecos District clamouring for the permits, the net benefit might approach zero. However, those suffering deprivation of an accustomed benefit are generally more distressed than new recipients are grateful. The net overall outcome probably would be slightly negative.

Table 4. *Scenario 1:* The Number and Percent of New Employment, Income and Gross Receipts Resulting from an Extreme Resource Reallocation by Impact Community, Santa Fe National Forest Social Impact Study.

Impact Community	New Employment / 1977 Employment	%	New Income / 1977 Income	%	New Gross Receipts / 1977 Gross Receipts	%
	Person Years		$		$	
(Cuba)	120 / 679	17.7	794,035 / 5,433,235	14.6	2,537,375 / 26,059,112	9.7
Espanola	147 / 1,979	7.4	998,348 / 15,297,008	6.5	3,193,687 / 56,285,125	5.7
Las Vegas	66 / 2,312	2.9	444,944 / 17,304,351	2.6	1,340,385 / 64,466,914	2.1
Santa Fe	561 / 17,647	3.2	3,073,707 / 132,585,658	2.3	8,123,069 / 465,429,291	1.7

Table 5. Scenario 2: The Number and Percent of New Employment, Income and Gross Receipts Resulting from a Moderate Resource Reallocation by Impact Community, Santa Fe National Forest Social Impact Study.

Impact Community	New Employment / 1977 Employment	%	New Income / 1977 Income	%	New Gross Receipts / 1977 Gross Receipts	%
	Person Years		$		$	
(Cuba)	52 / 679	7.7	341,668 / 5,433,235	6.3	1,175,157 / 26,059,112	4.5
Espanola	45 / 1,979	2.3	302,638 / 15,297,008	2.0	1,348,076 / 56,285,125	2.4
Las Vegas	20 / 2,312	0.9	141,016 / 17,304,351	0.8	477,123 / 64,466,914	0.7
Santa Fe	161 / 17,647	0.9	954,646 / 132,585,658	0.7	2,754,436 / 465,429,291	0.6

Table 6. Distribution of Jobs by Community and Economic Sector for Alternative Resource Allocation, Scenarios 1 and 2. Santa Fe National Forest Social Impact Study.

Economic Sector	Scenario	(Cuba) 1	(Cuba) 2	Española 1	Española 2	Las Vegas 1	Las Vegas 2	Santa Fe 1	Santa Fe 2	Total 1	Total 2
		number of jobs									
Logging		8	4	9	6	1	1	5	2	23	13
Sawmills		33	21	48	19	22	15	77	39	180	94
Auto and Gasoline		17	5	22	4	11	2	43	17	93	28
Eating and Drinking		19	7	17	2	8	1	75	28	119	38
Other Retail		33	10	37	7	18	3	149	43	237	63
Lodging		4	3	6	5	2	1	203	29	215	38
Other Services		6	2	8	2	4	0	9	3	27	7
Totals		120	52	147	45	66	23	561	161	894	281

The greatly increased recreation activity projected in scenario 1 could create a perception of decreased access or increased competition for locals. Such a perception would almost certainly increase the latent antipathy to outsiders and could precipitate sporadic acts of harrassment or even violence against the property of tourists.

Benefit distribution: jobs of any kind are important and it may even be argued that any job is better than no job at all. However, the mix of jobs in terms of income levels (and skill levels) is also recognized to be important. Scenario 1 generates a disproportionate number of lodging and retail jobs with a very skewed income distribution. Scenario 2 with a higher proportion of timber and sawmill jobs results in a more equitable overall income distribution and higher average incomes.

Service support: both scenarios increase gross receipts and gasoline tax revenues, therefore, both would make a positive contribution to support of public services. Scenario 1, since it generates substantially more revenue ($8.1 million vs. $2.7 million), is more desirable than scenario 2.

Service differentiation: an increase in economic activity of the order of magnitude projected for (Cuba) in scenario 2 is likely to attract one or more new privately provided services. Pending more empirical research it is not possible to precisely predict either the next type of service or the number which might accompany a given volume increase in gross receipts. It might well be some new or expanded retail outlet e.g., a lumber yard or a new line of sporting goods in an existing hardware

store. It is less likely that services would differentiate in Santa Fe or even in Española or Las Vages due to a much smaller percentage change in gross receipts.

Community solidarity and social participation: A direct concrete connection to either of these important indicators from the resources under evaluation if extremely difficult to establish.

A summary score card of the RSD's is presented in Table 7. These four criteria can be combined with the relevant client service data, economic data, technical and other data into the decision-making process.

RECOMMENDATIONS AND CONCLUSIONS

Minimum Skills for Model Operation

Social impact assessment uses technical procedures which require a minimal background plus some in-depth study and preparation on the part of the analyst. Just as an accountant would not be expected to be able to scale timber without training not every forester will be able to do adequate social impact assessment. Some considerable amount of time will be required to learn to operate this model. The amount of time required may be more realistically reckoned in weeks than in hours or minutes.

The following are the minimum skills which might be found in one individual but more likely could be found in a team of two or three within the Forest ranks:

1. Familiarity with the basic social and economic terminology.
2. Ability to interpret I-O Model.
3. A feeling for the Spanish-American culture.

The foregoing skills may have been acquired through formal college course work, self study or through experience, but they are essential if the model is to be applied with accuracy, sensitivity and feeling. Similarly

Table 7. Social Impact Scorecard.

RSD's	Assessment	
	Scenario 1	Scenario 2
Cultural Compatibility	Slightly negative; -1	Slightly negative; -1
Benefit Distribution	slightly negative; -1	very positive; +2
Service Support	(Cuba) moderate Española modest up to 9.7%	(Cuba) modest up to 4.5%
Service Differentiation	neutral to positive	positive (Cuba)
Community Solidarity	problematic	problematic
Social Participation	problematic	problematic

accurate sensitive interpretation and presentation to impacted community groups will require the same set of skills. It would seem that these skills probably exist among Forest personnel.

It is extremely important to emphasize that adequate social impact assessment will require adequate resources and priorities. A compatible team of appropriately skilled people must be carefully selected and allocated sufficient time to learn the model before assessment of alternative allocations is undertaken.

Future Data Needs

Most organizations collect, tabulate and analyze at least some data pertaining to their operations; the Forest Service is no exception. It is common for researchers to conclude their reports with observations on needs for further research; it helps to secure their continued employment. In this case we establish a partial exception. We will suggest data needs which would contribute to future social impact assessment but which would not require a consultant. They should be easily collected and tabulated by existing Forest personnel probably with very little additional effort. Indeed some of the data are already being kept.

We suggested that one very important category of social impacts is the client services including all recreation, all wildlife, non-commercial woodcutting and small permit grazing. Data on these activities are kept in RVD's, AUM's, etc. These data, to the extent they are accurate or based on sound estimation procedures, are very adequate for the supply of services. How is demand for each service estimated? For wilderness use,

it seems that entrance permit application information is tabulated on a computer. For this activity adequate data on active demand exist (provided all who approached the Forest in search of a wilderness experience actually filled out an application). What better criteria for planning and budgeting than estimating the proportion of unsatisfied demand, both active and latent for each service? A few services may have essentially infinite demands (in relation to potential supply), e.g., small permit grazing. However, demand for most services, e.g., picnicking, camping and wildlife viewing, can probably be met by the Forest, even for a rapidly growing population.

Concluding Observations

As was stated at the beginning, social impact analyses provides no easy answers for the tough problems associated with resource management. What it can do is provide explicit criteria and a rational systematic procedure. Our goal was to develop an explicit, systematic, yet reasonably simple procedure to evaluate social impacts of Forest policies.

It is fair to point out that the science/art of social impact analysis is yet in its infancy. Generally accepted quantitative models do not exist. This makes the current effort both exciting and somewhat perilous. The tool is sorely needed but there are few guideposts and data are not always available. Social impact assessment should be seen as an evolving process. With experience, availability of more data and the constructive criticism of colleagues, the models can be improved.

The Santa Fe National Forest operates in a very distinctive environment. An American minority forms the majority of the population immediately adjacent. Therefore cultural compatibility had to be judged

from the perspective of that culture. This inevitably leads to differences from the predominant Anglo perspective. Past cultural conflicts have left a legacy of residual hostility which focuses on land issues. The Forest Service is a primary target of this hostility. A culturally sensitive Forest administration has and can continue to soften the impacts on the local population and mitigate the problem. However, only forces beyond the Forest and the region, coupled with the passage of time, will ever resolve the issues completely.

APPENDIX A

RATIONALE FOR DELINEATION OF IMPACTED COMMUNITIES

Most of the population in close proximity to the Forest is concentrated in a few geographic locations or communities. Accordingly, the first step in impact evaluation is delineation of the community boundaries.

Political boundaries, e.g., municipalities or counties, are not satisfactory because they artificially separate contiguous populations, e.g., Española, Fairview, Santa Cruz, etc. Similarly, in this day of automobiles and good roads, the geographic isolation of open countryside is no longer a satisfactory criterion for community boundaries, e.g., Dixon, Velarde and Española.

Roland Warren provides a point of departure with his definition of community as "that combination of social units and systems which perform the major social functions having locality relevance. This is another way of saying that by 'community' we mean the organization of social activities to afford people daily local access to those broad areas of activity which are necessary to day-to-day living."[1]

In order to operationalize this somewhat abstract definition we first focus on the temporal cycle of life. The week is the shortest complete cycle of household activity. Adults work and children go to school five days each week; the whole household shops, plays and/or prays on Saturday

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[1] Roland L. Warren, The Community in America, Chicago: Rand McNally Co., 2nd Ed., 1972, p. 9 (emphasis in original).

and Sunday. On Monday the cycle starts over again. Therefore, in defining 'community' we must take into account this weekly cycle of activity.

The most relevant and useful criterion for assessing social impacts is that of the community as a service center.[2] Within what area do most of the residents obtain most of their daily and weekly services? For example, within what area do most residents work, buy groceries, gasoline and blue jeans, go to church or to school, belong to clubs and/or pass their leisure time? The boundaries of the service area delimit the functional community within which most residents spend most of their time. Since it is the stage on which most of their lives and energies are expended, the service area exerts a great influence on the quality of its residents' lives.

Jobs and other economic activities are first manifested at the community level. Households and businesses are stimulated by the additional dollars circulating in the community. New business services may appear as the community grows. Tax revenues support new or expanded public services. Residents have new or expanded leisure opportunities. Both social and economic impacts can be traced through the community, e.g., from household, to businesses or from public services to households.

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[2]This approach is completely consistent with Warren's definition. It draws primarily from Central Place Theory as originally elaborated by Walter Christaller. A more recent statement of the theory can be found in Brian J. L. Berry Central Place Studies: A Bibliography of Theory and Applications, Philadelphia: Regional Science Research Institute, 1965. This theory explains the spatial distribution of people and is the theoretical underpinning of much business and service site selection. Conversely it is useful in tracing the impacts of business and service activity.

This conception of community includes not only the service center at the core but all the surrounding open country population and villages (hinterland). These rural residents must also obtain services and their visits to service centers are more or less regular. Community boundaries can be and have been mapped reliably even through very sparsely populated hinterland. Transportation routes and barriers are prime factors determining the community boundaries.

The identification of community as service center does not deny the importance of more restricted groupings, most commonly referred to as neighborhoods, and which can be referred to as locality areas. Several services, e.g., primary schools, churches and convenience stores may be available in the locality area but most residents will also make daily trips to work or weekly trips to the supermarket for those essentials. Much daily and weekly social interaction extends beyond the locality area. Many villages which were functional communities in the day of the horse and buggy have become locality areas within the larger communities created by the automobile and improved roads.

Woodcutting, livestock grazing, hunting/fishing and other recreation opportunities may impact most often and most heavily on the population living in the vicinity of the Forest. What are these, population concentrations or communities? Between the east and west halves of the Santa Fe National Forest is a triangle of population concentration consisting of Santa Fe, Espanola and Los Alamos. Though there is substantial interaction all around the triangle, two points - Santa Fe, and Espanola - can be considered a fairly autonomous service centers. Las Vegas, including the Mora Valley as hinterland, is the

service center on the eastern edge of the Forest. On the western fringe (Cuba) could be considered a quasi-community.[3] Isolation, even in this day of the automobile makes it more autonomous and self sufficient than most villages with much larger populations. A larger portion of its residents regularly go outside its boundaries to meet weekly service needs, e.g., groceries, and other shopping, than is the case in any of the other communities.

Albuquerque, though somewhat distant from the Forest, is impacted in important ways by Forest policies. The Forest provides prime outdoor recreation, wildlife experiences and a source of firewood to New Mexico's only metropolitan area. Moreover, it is close enough to be accessible on a weekly basis. Albuquerque residents can easily travel to the Forest, cut firewood, picnic, fish, hike and/or enjoy nature and return home in one day. Vacation homes and campsites can be utilized any weekend during the year.

There are a few sub-communities or locality areas which are isolated and unusually dependent on the Forest. The lack of service closure or autonomy precludes a definitive assessment of impacts in small locality areas. However, since the Forest exerts such an inordinate influence on the social and economic activities in these isolated locality areas, a less than complete evaluation of their impacts is warranted. Three locality areas, Gallina-Coyote, Jemez and Pecos merit such attention.

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[3] Cuba will be enclosed in brackets (Cuba) to emphasize that it is a quasi-community lacking the same degree of closure or autonomy of the other communities.

One further classification of community impacts may merit some consideration. Santa Fe, Española, Las Vegas and (Cuba) are impacted by Forest Service policies in multi-faceted ways. Grazing, woodcutting, wildlife and recreation all impact on these communities in inter-related ways. Albuquerque and Los Alamos residents, on the other hand, use the Forest primarily for recreation, hunting/fishing and, to a lesser extent, firewood. While some logs may be milled in Albuquerque's lower valley, this would account for only a minute fraction of the total economic activity of the metropolitan area. The latter two communities thus have a rather narrow scope of relationship to the Forest, since it is primarily for leisure pursuit.

APPENDIX B

ECONOMIC PROCEDURES FOR THE SOCIAL ANALYSIS MODEL

POPULATION

1. Record villages, towns and cities in each community area.

2. Estimate percent of county rural area in each community area.

3. Record populations of villages, towns and cities from Rand McNally Commercial Atlas.

4. Record county populations in 1977 for each community area from N.M. Business Magazine, August 1978.

5. Subtract populations of villages, towns and cities (Step 3, above) from county populations after adjustments from Rand McNally data to 1977.

6. Apply percentages (Step 2 above) to differences (Step 5, above) to determine rural populations in each community area.

7. Add rural populations to villages, towns and cities for each community area.

8. Project populations based on a moderate level forecast of county populations by N.M. Bureau of Business and Economic Research (Temple, John L., New Mexico Population to 1985 and Impact on Job Outlook, April 15, 1976). Weight counties in each community area, determine index of change and apply to estimated populations in 1977 (Step 7, above).

EMPLOYMENT

1. Record 1977 (second quarter) employment by county by business sector from Employment Security Reports, N.M., including Taos County.

2. Subtract Taos County employment totals from seven county totals.

3. Disaggregate (divide) Employment Security Report totals to each county based on populations estimates procedures.

4. Adjust employment in each sector in each community area so that Employment Security Report totals in each sector conform to the I-O Model totals in each sector for the six county area, less proportions of Rio Arriba County not included in study area or in any community area.

5. Allocate employment in each sector to each community area using community area population estimates.

6. Project employment to 1980 and 1990 by allocating 1980 and 1990 population estimates by the Bureau of Business and Economic Research to each community area, using the same techniques as was used for 1977 populations.

7. Indexes of changes were applied to 1977 employment by sector by community area for the 1980 and 1990 estimates.

OUTPUT

1. Determine 1977 value of production of livestock and livestock products as well as value of the major crops for each of the seven counties.

2. Adjust the seven county values to the I-O Model gross output.

3. Allocate livestock and livestock product output as well as crop output to each community area based on the rural area in each community area, using percentages developed in POPULATION, Step 2.

4. Divide each sector other than livestock and crops in the I-O Model outputs by total employment of the appropriate sector for the seven county area.

5. Multiply average output/employee in each sector by employment in each sector in the four community areas, from EMPLOYMENT, Step 5.

6. For 1980 and 1990 output, determine change in range and timber from F.S. projections.

7. Adjust total output in Range Livestock, Logging and Sawmills sectors by anticipated F.S. changes.

8. Assume no increase in the Gas and Repair Sector in 1980 and 1990 (Gas station declines will be offset by repair shop increases).

9. Allocate any surplus of total output based on population changes in the community areas to personal services and other services, proportional to their totals in 1977 in each community area.

INCOME, FINAL DEMAND, VALUE ADDED AND TYPE I OUTPUT MULTIPLIERS

1. Multiply total output in 1977, 1980 and 1990 for each sector for each community area by the seven county coefficients for income and value-added.

2. Calculate final demand coefficients for each sector by dividing the seven county final demand in the I-O Model in 1977 by total output. Use final demand coefficients for 1980 and 1990 in each community area.

3. Multiply final demand coefficients calculated in Step 2, above, by total output in each sector in each community area.

4. Using population and employment numbers in each community area in each sector in each time period, calculate Type I Output Multipliers for 1977,

EARNINGS DISTRIBUTION

1. Record percentage distributions of earnings in each sector from the 1970 Census of Population for New Mexico.

2. Record median earnings for each sector from the same source as Step 1, above.

3. Adjust intervals of all sectors based on weighted average index of change in rates of earnings (weighted by numbers of employees in each sector) and based on the 1970 Census median compared to the I-O Model average incomes in each sector. Round answer (it was estimated that a 100 percent increase approached the weighted average).

4. Select an average earning value for each earning range in the interval. To account for skewness, average earnings were selected below the midpoint in each interval (e.g., $1,500 for the interval $1 - $3,999, $5,500 for the interval $4,000 - $7,999, and $40,000 for the interval $30,000 and over).

5. Multiply percentages in each interval of each sector times the average earning value of the interval and accumulate an overall average earnings for each sector.

6. Compare the calculated average earnings with the I-O seven county model average incomes in each sector.

7. Adjust the percentages to increase or decrease average earnings and repeat Step 5, above until the computer average earnings and reported seven county model average incomes are approximately equal.

ALTERNATIVE RESOURCE IMPACTS

1. Allocate ranger districts to each community area based on area boundaries.

2. Determine final demand in each of 22 sectors from changes in the 16 activities.

3. Allocate final demand changes in each ranger district to each community area using percentages in step 1.

4. Using 7-county coefficients, estimate total or gross output and income in each community area.

5. Using 7-county average salaries calculate employment in each sector in each community area.

6. Report changes in income and employment for social impact model use.

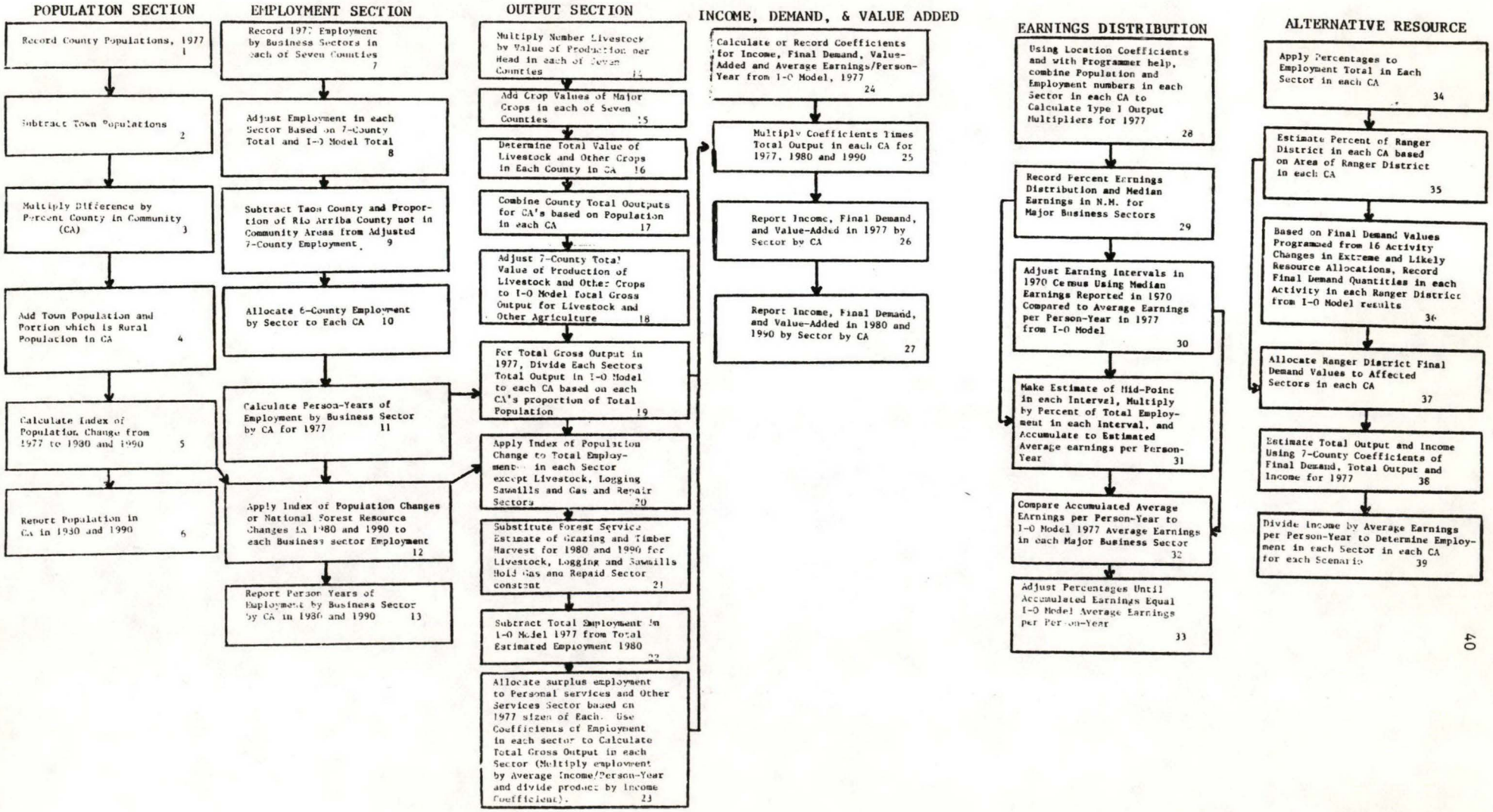
SPECIAL LIMITATION IN I-O ANALYSIS

1. Areas with less than 50,000 populations may result in unrealistic values.

2. Albuquerque is not included in the model beyond population estimates.

(A flow chart of the economic procedures appears in Appendix Figure 1 and an application to Las Vegas appears in Appendix C.)

APPENDIX FIGURE 1. FLOW CHART - ECONOMIC AND SOCIAL ANALYSIS PROCEDURES


POPULATION SECTION
Record County Populations, 1977 1
Subtract Town Populations 2
Multiply Difference by Percent County in Community (CA) 3
Add Town Population and Portion which is Rural Population in CA 4
Calculate Index of Population Change from 1977 to 1980 and 1990 5
Report Population in CA in 1980 and 1990 6
EMPLOYMENT SECTION
Record 1977 Employment by Business Sectors in each of Seven Counties 7
Adjust Employment in each Sector Based on 7-County Total and I-O Model Total 8
Subtract Taos County and Proportion of Rio Arriba County not in Community Areas from Adjusted 7-County Employment 9
Allocate 6-County Employment by Sector to Each CA 10
Calculate Person-Years of Employment by Business Sector by CA for 1977 11
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Appendix Table 1. Scenario 1, Extreme Alternative Plan, Resource Changes, Santa Fe National Forest Social Impact Study.

Activity Area	Units	RANGER DISTRICTS (Cuba)	Española	Tesuque	Jemez	Pecos	Las Vegas	Coyote	TOTAL New Total	(Change)
1	MBF	0	+1,000	+1,000	0	0	0	0	2,000	(+2,000)
2	MBF	0	0	0	0	0	0	0	0	0
3	MBF	+3,000	+2,000	+3,000	+5,000	+3,000	+2,000	+2,000	55,000	(+20,000)
4	MBF	+400	+150	+200	+200	+100	+50	+500	2,400	(+1,600)
5	RVD	+40,000	+40,000	+40,000	+70,000	+50,000	+40,000	+20,000	394,600	(+300,000)
6	RVD	+250,000	+100,000	+100,000	+150,000	+150,000	+100,000	+150,000	1,560,700	(1,000,000)
7	RVD	0	0	+150,000	0	0	0	0	298,000	(+150,000)
8	RVD	0	0	+10,000	0	+1,000	+1,000	+8,000	34,200	(+20,000)
9	RVD	+75,000	+75,000	+70,000	+70,000	+70,000	+40,000	+75,000	738,000	(+475,000)
10	RVD	+80,000	+100,000	+80,000	+60,000	+80,000	+100,000	+100,000	798,000	(+600,000)
11	RVD	+4,000	+4,000	0	0	+4,000	+4,000	+4,000	78,000	(+20,000)
12	RVD	+1,000	+1,000	0	0	+1,000	+1,000	+1,000	16,200	(+5,000)
13	RVD	+50,000	+40,000	+30,000	+20,000	+20,000	+20,000	+20,000	368,000	(+200,000)
14	RVD	+15,000	+5,000	+10,000	+20,000	+20,000	+5,000	+5,000	242,700	(+80,000)
15	AUM	0	0	+1,000	+2,000	+2,000	0	0	88,000	(+5,000)
16	AUM	0	0	0	0	0	0	0	0	0

Appendix Table 2. Scenario 2, Likely Alternative Plan, Resource Changes, Santa Fe National Forest Social Impact Study.

Activity Area	Units	RANGER DISTRICTS (Cuba)	Española	Tesuque	Jemez	Pecos	Las Vegas	Coyote	TOTAL New Total	(Change)
1	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	
3	MBF	+2,000	+1,000	+1,000	+1,500	+2,500	+1,000	+1,000	45,000	(+10,000)
4	MBF	+200	+100	+50	+50	+50	+50	+300	1,600	(+800)
5	RVD	+10,000	+10,000	+20,000	+35,000	+15,000	+8,000	+2,000	194,000	(+100,000)
6	RVD	+100,000	+10,000	+140,000	+100,000	+135,000	+10,000	+5,000	1,060,700	(+500,000)
7	RVD	0	0	+15,000	0	0	0	0	65,600	(+15,000)
8	RVD	0	0	+10,000	0	+1,000	+1,000	+8,000	34,200	(+20,000)
9	RVD	+15,000	+15,000	+30,000	+80,000	+40,000	+10,000	+10,000	438,000	(+200,000)
10	RVD	+5,000	+10,000	+10,000	+30,000	+20,000	+10,000	+15,000	298,000	(+100,000)
11	RVD	+2,000	+2,000	0	0	+2,000	+2,000	+2,000	68,000	(+10,000)
12	RVD	+500	0	0	+500	+500	0	+500	13,200	(+2,000)
13	RVD	+15,000	+10,000	+10,000	+5,000	+5,000	+5,000	+10,000	228,000	(+60,000)
14	RVD	+7,000	+2,000	+5,000	+10,000	+10,000	+3,000	+3,000	202,700	(+40,000)
15	AUM	-1,000	0	0	0	+3,000	0	-2,000	83,000	(0)
16	AUM	0	0	0	0	0	0	0	0	

Appendix Table 3. Changes in Final Demand by Selected Sectors and Districts, Santa Fe National Forest Social Impact Study.

No.	Industry Sector	(Cuba)	Española	Tesuque	Jemez	Pecos	Las Vegas	Coyote	Total
					Dollars				
SCENARIO 1 - EXTREME ALTERNATIVE PLAN									
1	Livestock	- -	- -	23	46	46	- -	- -	114
9	Logging	215,840	80,940	107,920	107,920	53,960	26,980	269,800	863,360
10	Sawmill	628,800	628,800	838,400	1,048,000	628,800	419,200	419,200	4,611,200
16	Auto and Gas	301,550	229,950	527,300	246,700	246,670	190,270	234,010	1,976,450
17	Eat and Drink Places	196,520	79,320	653,700	118,900	122,370	81,320	133,820	1,385,950
18	Other Retail Trade	456,480	286,280	1,831,000	306,900	327,550	261,650	366,940	3,836,800
20	Lodging	17,860	8,360	1,445,500	19,000	27,610	13,360	48,360	1,580,050
22	Other Services	77,480	69,980	52,929	50,000	72,480	62,980	62,980	448,829
SCENARIO 2 - LIKELY ALTERNATIVE PLAN									
1	Livestock	23	- -	- -	- -	69	- -	46	- -
9	Logging	107,920	53,960	26,980	26,980	26,980	26,980	161,880	431,680
10	Sawmill	419,200	209,600	209,600	314,400	524,000	209,600	209,600	2,096,000
16	Auto and Gas	86,320	39,970	164,200	171,350	134,070	33,000	39,290	668,200
17	Eat and Drink	78,925	8,740	184,150	78,735	108,385	10,910	21,095	490,940
18	Retail Trade	148,840	42,060	411,800	196,330	213,010	41,680	83,900	1,137,620
20	Lodging	8,455	3,500	193,350	9,705	16,305	9,450	44,655	285,420
22	Other Services	22,440	16,540	12,843	23,650	27,490	15,890	19,790	138,643

Appendix
Table 4. Summary of Economic Impacts for the Española Community Area, Santa Fe National Forest Social Impact Study.

Economic Measures	Units	1977	Scenario 1	Scenario 2	1980	1990
Final Demand	000 Dol.	43,228.715	45,686.922	44,009.264	44,891.221	50,300.308
Total Gross Output	000 Dol.	56,285.125	59,478.812	57,633.201	59,163.882	66,249.335
Labor	Man-Years	1,979	2,126	2,024	2,092	2,360
Income	000 Dol.	15,297.008	16,295.356	15,599.646	15,999.951	18,070.992

Appendix
Table 5. Summary of Economic Impacts for the (Cuba) Community Area, Santa Fe National Forest Social Impact Study.

Economics Measures	Units	1977	Scenario 1	Scenario 2	1980	1990
Final Demand	000 Dol.	19,847.032	21,823.039	20,718.807	24,253.435	29,770.420
Total Gross Output	000 Dol.	26,059.112	28,596.487	27,234.269	31,550.689	38,643.713
Labor	Man-Years	679	799	731	817	1,012
Income	000 Dol.	5,433.235	6,227.270	5,774.903	6,619.128	8,214.199

Appendix
Table 6. Summary of Economic Impacts for the Las Vegas Community Area, Santa Fe National Forest Social Impact Study.

Economic Measures	Units	1977	Scenario 1	Scenario 2	1980	1990
Final Demand	000 Dol.	48,381.376	49,437.136	48,728.886	51,668.889	61,679.237
Total Gross Output	000 Dol.	64,466.914	65,807.299	64,944.037	69,252.472	81,824.322
Labor	Man-Years	2,312	2,378	2,332	2,446	2,924
Income	000 Dol.	17,304.351	17,749.295	17,445.367	18,603,597	42,590.316

Appendix
Table 7. Summary of Economic Impacts for the Santa Fe Community Area, Santa Fe National Forest Social Impact Study.

Economic Measures	Units	1977	Scenario 1	Scenario 2	1980	1990
Final Demand	000 Dol.	365,036.137	371,972.395	367,289.369	391,232.345	484,297.646
Total Gross Output	000 Dol.	465,429.291	473,552.360	468,183.727	449,430.275	618,336.306
Labor	Man-Years	17,647	18,208	17,808	18,933	23,474
Income	000 Dol.	132,585.658	135,659.365	133,540.304	142,175.264	176,268.135

Appendix

Table 8. Actual Municipal Expenditures, 1976-1977, for Communities and Locality Areas, Santa Fe National Forest Social Impact Study, 1977.

Fund	Albuquerque	(Cuba)	Española	Jemez Springs	Las Vegas	Los Alamos	Pecos	Santa Fe
GENERAL								
Personal Services	31,373,156	42,314	503,654	22,462	734,846	2,356,680	22,400	4,059,004
Operating Expense	11,235,225	52,074	258,560	16,377	362,174	1,120,058	17,918	1,915,146
Capital Outlay	892,039	84,518	82,135	1,177	-0-	110,154	8,488	165,944
Lease Purchase Payment	-0-	5,488	-0-	-0-	6,090	-0-	-0-	-0-
TOTAL GENERAL	43,500,420	184,394	844,349	40,016	1,103,110	3,586,892	48,806	6,140,094
FIRE PROTECTION								
Operating Expense	14,475	8,415	-0-	5,984	504	-0-	4,898	15,434
Capital Outlay	176,266	-0-	20,254	1,150	-0-	-0-	259	22,052
Lease Purchase Payment	-0-	-0-	-0-	-0-	-0-	-0-	3,100	-0-
TOTAL FIRE PROTECTION	190,741	8,415	20,254	7,134	504	-0-	8,257	37,486
RECREATION								
Personal Services	-0-	3,272	83,316	-0-	473	-0-	4,086	55,043
Operating Expense	-0-	-0-	46,224	361	8,953	-0-	5,960	-0-
Capital Outlay	-0-	-0-	386	-0-	-0-	-0-	-0-	-0-
Lease Purchase Payment	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
TOTAL RECREATION	-0-	3,272	129,926	361	9,426	-0-	10,046	55,043
REVENUE SHARING								
Personal Services	8,080,408	22,960	-0-	-0-	-0-	-0-	-0-	49,373
Operating Expense	259,445	2,200	74,464	-0-	12,934	1,492	-0-	127,110
Capital Outlay	633,916	-0-	93,086	569	68,098	-0-	16,340	382,303
Lease Purchase Payment	-0-	-0-	10,628	-0-	-0-	-0-	-0-	-0-
TOTAL REVENUE SHARING	8,973,769	25,160	178,178	569	81,032	1,492	16,340	558,786
UTILITIES								
Personal Services	3,805,318	27,196	106,328	358	115,336	-0-	14,552	234.223
Operating Expense	5,527,704	-0-	125,662	7,584	1,244,537	3,750,745	8,410	87,201
Capital Outlay	377,448	2,595	19,167	2,459	-0-	9,818	12,588	807
Lease Purchase Payment	-0-	38,020	-0-	-0-	5,595	-0-	-0-	-0-
TOTAL UTILITIES	9,710,470	67,811	251,157	10,401	1,365,468	3,760,563	35,550	322,231
OTHER								
Personal Services	5,677,723	-0-	129,877	6,452	57,685	183,884	5,020	368,842
Operating Expense	20,302,102	-0-	61,259	-0-	48,640	484,581	-0-	317,831
Capital Outlay	1,066,994	-0-	52,517	-0-	3,641	100,564	-0-	36,763
Lease Purchase Payment	-0-	-0-	-0-	-0-	13,798	-0-	-0-	-0-
TOTAL OTHER	27,046,819	-0-	243,653	6,452	123,764	769,029	5,020	723,436
DEBT SERVICE								
G.O. Bonds	15,476,955	-0-	45,263	-0-	47,589	53,925	-0-	574,274
Revenue Bonds	4,063,839	34,855	88,982	7,229	111,274	-0-	4,050	33,412
TOTAL DEBT SERVICE	19,540,794	34,855	134,245	7,229	158,863	53,925	4,050	607,686
GRAND TOTAL EXPENDITURES	108,963,013	323,907	1,801,762	72,162	2,842,167	8,171,901	128,069	8,445,762

Source: New Mexico Municipal Government, Eighteenth Annual Report 1976-1977, Department of Finance and Administration Local Government Division, pages 27, 32, 34, 39, 40, 43, and 46.

Appendix

Table 9. Actual Municipal Revenues, 1976-1977, for Communities and Locality Areas, Santa Fe National Forest Social Impact Study, 1977.

Fund	Albuquerque	(Cuba)	Española	Jemez Springs	Las Vegas	Los Alamos	Pecos	Santa Fe
GENERAL								
Taxes								
Property	1,747,970	864	12,268	504	39,531	518,610	1,781	211,829
Franchise	2,148,774	3,596	27,158	100	60,662	123,385	1,571	387,408
Occupation	1,885,145	-0-	57,817	1,008	51,007	66,571	-0-	307,537
Lodgers 75%	368,474	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Gross Receipts	4,643,142	-0-	122,540	-0-	-0-	699,605	1,125	779,103
Licenses and Permits	1,344,988	2,272	20,164	650	36,685	39,412	3,755	291,192
State Shared Taxes								
Gasoline	2,265,422	33,869	110,174	2,741	126,516	48,531	6,797	384,028
Auto License Distribution	674,742	2,828	35,065	1,460	25,985	47,940	633	105,971
Cigarette 2¢	778,744	3,745	15,996	2,893	28,903	30,796	2,258	109,092
Gross Receipts	18,573,367	63,410	499,660	12,078	567,295	-0-	29,258	3,104,176
Charges for Services	947,183	250	4,673	3,341	18,850	333,690	4,018	67,069
Fines and Forfeits	1,715,410	5,788	29,855	3,061	44,988	30,944	75	120,199
Other	2,223,574	9,637	15,927	5,012	47,033	215,879	1,264	257,753
Grants	2,982,799	1,504	106,385	4,558	56,666	1,443,358	24,693	67,502
TOTAL GENERAL	42,299,934	127,763	1,057,682	37,426	1,104,121	3,598,721	77,228	6,192,859
FIRE PROTECTION								
Fire Allotment	114,250	6,000	17,250	9,500	18,250	-0-	9,500	44,250
Other	13,972	-0-	-0-	250	16,210	-0-	226	903
TOTAL FIRE	128,222	6,000	17,250	9,750	34,460	-0-	9,726	45,153
RECREATION								
Cigarette Tax 1¢	389,372	1,984	9,204	1,447	14,451	10,265	1,129	68,424
Other	1,292	-0-	26,646	-0-	1,046	-0-	3,441	170
TOTAL RECREATION	390,664	1,984	35,850	1,447	15,497	10,265	4,570	68,594
REVENUE SHARING								
Federal Allotment	6,776,994	6,526	184,577	2,493	169,235	84,013	9,371	660,331
Interest on Investments	256,483	393	-0-	-0-	-0-	7,440	344	48
TOTAL REVENUE SHARING	7,033,477	6,919	184,577	2,493	169,235	91,453	9,715	660,379
UTILITIES								
Joint	16,079,000	87,499	268,635	-0-	-0-	-0-	27,025	-0-
Water	-0-	-0-	-0-	-0-	-0-	860,991	-0-	-0-
Sewer	-0-	-0-	-0-	11,218	89,504	395,094	-0-	369,605
Electric	-0-	-0-	-0-	-0-	-0-	1,584,752	-0-	-0-
Gas	-0-	-0-	-0-	-0-	1,538,204	1,512,454	-0-	-0-
TOTAL UTILITIES	16,079,000	87,499	268,635	11,218	1,627,708	4,353,291	27,025	369,605
TOTAL OTHER FUNDS	29,075,205	2,038	178,912	25,523	54,249	641,573	4,703	802,422
TOTAL DEBT SERVICE	16,377,333	-0-	68,187	-0-	84,680	167,524	-0-	426,097
GRAND TOTAL REVENUES	111,383,835	232,203	1,810,993	87,857	3,089,950	8,862,827	132,967	8,565,109

Source: New Mexico Municipal Governments, Eighteenth Annual Report, 1976-1977, Department of Finance and Administration Local Government Division, pages 2, 7, 9, 14, 15, 18, and 21.

APPENDIX C

DEMONSTRATION CALCULATIONS - LAS VEGAS COMMUNITY

KEYED TO FLOW CHART

Flow Chart Block

POPULATION

1. Total county population in 1977 was San Miguel 22,700, Mora 4,800.

2. Population of towns in each county was San Miguel 15,717, Mora 3,548. Total = 15,717 + 3,548 = 19,265.

   If significant numbers of towns in county are outside CA boundaries, population of these towns must be subtracted from Item 2 for final estimate in Item 4, below.

3. Difference between total county and town population was rural population. San Miguel 22,700 - 15,717 = 5,475, Mora 4,800 - 3,548 = 1,252.

   Percent rural area in CA was San Miguel 75.8%, Mora 96.0%.

   Multiplying rural population by percent rural area in CA 5,475 x 75.8% = 4,150, 1,252 x 96.0% = 1,202. Total = 4,150 + 1,202 = 5,352.

4. Adding town and rural populations together equals total population in CA. 19,265 + 5,352 = 24,617.

5. Weighted average indexes of population changes, with weights based on estimated populations in two counties CA's in 1977, were in 1980 = 1.0579, and in 1990 = 1.26.

6. Estimate population in CA in 1980 and 1990.
   (1977 population) 24,617 x (1980 index) 1.0579 = 26,037
   (1977 population) 24,617 x (1990 index) 1.26 = 31,039

EMPLOYMENT

10. Record adjusted employment from Employment Security Report for each county. Adjustment described in blocks 7-9. Example, for Construction employment sector: San Miguel 196, Mora 5, Total 201. Proportion of population in CA in each county was San Miguel 87.5%, Mora 99.0%. Construction employment was County employment x Population in CA San Miguel 196 x 87.5%, plus Mora 5 x 99.0% = 176.

No adjustment was necessary for the Construction Sector as 7-county Employment Security Totals were same as I-O Model totals.

12. Apply 1980 population change factor to adjusted employment by sectors.

13. For construction employment, 1980 index was 1.0579, employment was 1976. 176 x 1.0579 - 186

OUTPUT

14. Seven county value of production for all livestock was $69,427,175, from "New Mexico Agriculture", number of livestock x average value of production per head.

16. Total value of livestock production in San Miguel was 19,404,900, in Mora it was 10,788,700, or a total value of 30,193,600.

Proportion of rural area of each county in the CA was San Miguel 75.8%, Mora 96.0%.

The total value of cattle production in New Mexico in 1977 was taken from page 105 of NM Agricultural Statistics 1977. The numbered cattle was taken from page 103, same source. The average value of production per head in New Mexico was multiplied by the total number of cattle in each county, taken from pp. 122-123, same source. Values were accumulated for seven counties. The 7-county total was then compared to the I-O model gross output. The I-O model value was 35.7 percent of the 7-county total. This factor was used to adjust the San Miguel and Mora county livestock production values downward.

This was necessary because without the adjustment the sums of the value of the livestock sector of the four CA's would have been much larger than the I-O model gross output. As it was necessary to use the I-O model as our basic economic tool, along with its various coefficients, we had to adjust our outputs in CA's to this model's total outputs.

17. Total value of livestock in the CA was total values of production times proportion of rural area in CA. 19,404,900 x 75.8% plus 10,788,700 x 96% = 25,066.066.

18. Adjustment factor based on gross output reported in I-O Model and seven county total was I-O Model 24,800,609 divided by 7-county 69,427,175 = 0.3572176. Adjusted total gross output in CA was 25,066,066 x 0.3572176 = 8,954,040.

19. For other sectors than livestock and other agriculture, for example the construction sector, construction employment times total gross output per employee equals total output. Construction employment in CA = 176 x 42,741 = 7,522,416.

20. For 1980 and 1990 estimates of output, multiply 1977 total gross output times index of population change to 1980 for CA, for example in the 7,522,416 x 1.0579 = $7,949,826.

21. For grazing and timber harvest, used index of change anticipated by Forest Service in these activities in National Forest. For the logging sector, 1,057,826 in 1977 x 1.136 = 1,202,075 in 1980.

22. Multiply total labor all sectors in CA in 1977 times population change index for CA from 1977 to 1980, 2,312 x 1.0579 = 2,446 total employment in 1980.

23. Allocate surplus employment to personal and other services based on size of each in 1977 in CA.

    2,446 - 2,312 = 134 total surplus jobs. Of the 134 additional jobs, 91 jobs were allocated to other sectors. The remaining 43 jobs to personal and other services.

INCOME, FINAL DEMAND SECTION

24. See Attachment Table 1.

25 &
26. For the Livestock sector, total gross output was 8,954,000.

    Output x Final Demand Coefficient = Final Demand
    8,954,000 x .6370 = 5,703,698

    Output x Income Coefficient = Income
    8,954,000 x .2240 = 2,005,705

    Output x Value-Added Coefficient = Value-Added
    8,954,000 x .2562 = 2,294,025

27. For the Livestock sector, total gross output was 9,766,662.

    Output x Final Demand Coefficient = Final Demand
    9,766,662 x .6370 = 6,221,364

EARNINGS DISTRIBUTION

29. Earning distribution was computed for all CA's, rather than for each CA. Once distribution was completed, it was applied to each sector's employment in each CA. Original distribution of income in the Census of Population was 1-999, 1,000-1,999, 2,000-2,999, etc. to 5,000-7,499, and 7,500 & over.

30. Adjusted distribution used was 1-3,999, 4,000-7,999, 8,000-9,999, 10,000-11,999, 12,000-13,999, 14,000-15,999, 16,000-19,999, 20,000-29,999, and 30,000 and over.

31. Estimate mid-points in each interval (see footnote in Table 3). Multiply each mid-point by estimated percentage and accumulate to an average wage.

32. Compare weighted average wage to I-O Model average income/person year.

33. Adjust percentages so that weighted average wage = I-O Model average income. For example, Livestock sector weighted average was 5,750, I-O Model average for 7-county area was 5,780.

34. Apply percentages to determine number of full-time employees in each income interval class in each sector in the Las Vegas CA. For example, in the livestock sector 129 were in the 1-3,999 group, 125 in the 4,000-7,999 group, etc.

ALTERNATIVE RESOURCES

35. Percent of Las Vegas Ranger District that was included in the Las Vegas CA was 100.

36. Resource changes in Scenario 1 for the Las Vegas CA, according to Appendix Table 1, was Activity 1 - 0 change, Activity 2 - 0 change, Activity 3 - +2,000 change, Activity 4 - +50 change, etc.

    Final Demand changes in the Las Vegas CA, Scenario 1, according to Appendix Table 3 for the Livestock sector was 0, Logging sector 26,980, etc.

37. Allocate final demand for the Las Vegas Ranger District to the Las Vegas CA based on 100% of District being in CA. Livestock - 0 x 100% = 0, Logging sector - 26,980 x 100% = 26,980, etc.

38. Estimate total gross output and income in Las Vegas CA, according to Appendix Table 3, was Logging sector final demand +26,980, plus Logging sector original final demand of 665,796 - Logging final demand for Scenario 1 in the Las Vegas CA.

    Final Demand divided by Final Demand Coefficient = Total Gross Output 692,776 divided by .6294 = 1,100,693.

    Total Gross Output x Income Coefficient = Income
    1,100,693 x .1590 = 175,010

    Income divided by Income/Person-Year = Employment
    175,000 divided by 7,645 = 23

APPENDIX D

PROCEDURES FOR ASSESSMENT OF RELEVANT SOCIAL DIMENSIONS

I. Cultural Compatibility

Basic criterion: Actual or perceived accessibility to the Forest by local residents for their traditional activities e.g., grazing, cutting firewood, posts or poles, gathering piñon nuts, hunting or fishing.

Rank Order of Importance of Traditional Spanish-American Activities on the Forest

I. Grazing (Most Important)	A key element in the traditional subsistence agriculture; cattle still enhance self-esteem, provide a sense of security and a satisfying avocation for a moderate number of older families.
II. Woodcutting	Village forests provided fuelwood for cooking and heating, fence posts and corral poles. These important products were available for the harvesting at no cash outlay. Woodcutting remains one of the most widespread activities of residents on the Forest.
III. Hunting	Deer hunting, in particular, remains important as much for the sport and self-image as for the meat it provides. Game was an important supplemental source of meat for villagers up to very recent times.
IV. Other (Less Important)	Includes gathering piñon nuts, fishing, picnicking, riding and other activities. Free entry and use of forests which surround the village was a well established right.

If the proposed alteration in resource allocation constrains actual or perceived access then it will be perceived as incompatible. The greater the constraint the greater the degree of incompatibility.

Cultural Compatibility Scale

Access Alteration by Reallocation	Scale Score
Substantially enhanced e.g., significant increase in grazing permits in one or more districts or, significant new allocations of fuelwood in a high demand district.	+2
Moderately enhanced e.g., small increase in grazing permits in a low demand district or	+1
No change traditional use patterns unaffected	0
Moderately reduced e.g., significant increase in recreation (reduction may be more perceived than actual); transfer of grazing permits from one area to another; shifting woodcutting to less accessible areas	-1
Substantially reduced e.g., reduction of grazing or woodcutting permits.	-2

Discussion of proposed alternatives: in the case of reduced grazing allocations in two districts there is a direct threat to traditional access in an activity of the first importance. It seems improbable that increased grazing allotments elsewhere will be perceived as sufficient compensation due to inconvenience of distance, unfamiliar terrain and conditions and other factors.

In the case of greatly increased recreation, reduced access may be less actual than perceived. However, tourists have been harassed by local residents in the past and there is every indication that a larger number would generate even greater hostility.

II. Benefit Distribution

Basic criteria: the distribution of incomes and level of average incomes generated.

The more even the distribution of incomes and the higher the average income the more desirable and equitable the altered resource allocation would be. The results of the Input/Output analyses indicates the numbers of new jobs and the sectors in which they would occur. Table 3 permits comparisons among sectors both as to distribution of jobs among income levels and average levels.

Benefit Distribution Scale

Distribution and Level of Income Generated by Reallocation	Scale Score
Very Positive e.g., relatively even distribution of new income plus relatively high average income.	+2
Positive e.g., relatively even distribution of new income or relatively high average income.	+1
No Change	0
Slightly Negative Relatively uneven distribution or low average income.	-1
Negative Relatively uneven distribution plus low average income.	-2

Discussion of proposed alternatives: in the case of timber and sawmill jobs there is a more even distribution and higher average income than in retail and lodging making increased activity in the former sectors more desirable on this dimension.

III. Service Support

Basic criterion: the level of gross receipts. Changes in the level of gross receipts can be indicated directly as a percentage. The greater the level of gross receipts the greater the revenue base for the support of public services. This is a proxy for quality of services which is the ultimate goal or concern but which is difficult and expensive to assess directly. Changes may range from a few tenths of one percent up to about 10 percent.

Service Support Scale

Impact of Change	Amount of Change (%)
Moderate, would permit a new service or improvement of a few services	7-10
Modest, would permit small levels of service improvement	3-6
Barely perceptible	2 or less

Discussion of proposed alternatives: the impact in (Cuba) would be modest to moderate and would significantly increase service support. Under scenario 1 Española would receive a moderate impact otherwise the impacts would be modest to barely perceptible.

IV. Service Differentiation

Basic criterion: The appearance of a new type of service.

The Forest can create new services directly, particularly in recreation. A substantial increase in the volume of economic activity in smaller communities could increase differentiation by one or two new private services. Increased differentiation is generally desirable.

An increase in the volume of economic activity on the order of magnitude of 10 to 25 percent could be followed by the appearance of one new type of service in small communities like (Cuba).[7]

Discussion of proposed alternatives: (Cuba) is the most likely to become further differentiated. It is the only community with a change of the order of magnitude to significantly enhance services.

V. a. Community Solidarity

Basic criterion: the degree of cohesiveness (as opposed to polarized factors) within the community.

Does the alteration in resource allocation tend to draw the community together to work toward some common goal or does it polarize the community into two or more opposing factions?

b. Social Participation

Basic criterion: the level of involvement in community activities, clubs, churches, service organizations, political and governmental activities, etc.

Generally speaking the greater the level of social participation the more desirable the quality of life in the community.

Discussion of proposed alternatives: in the cases of these scenarios it is extremely unlikely there would be any measurable impact on either solidarity or participation. In other situations there could be impacts, negative or social participation e.g., if a large number of outside workers were brought in. Transient workers may drink in bars but they don't register to vote, join social organizations or

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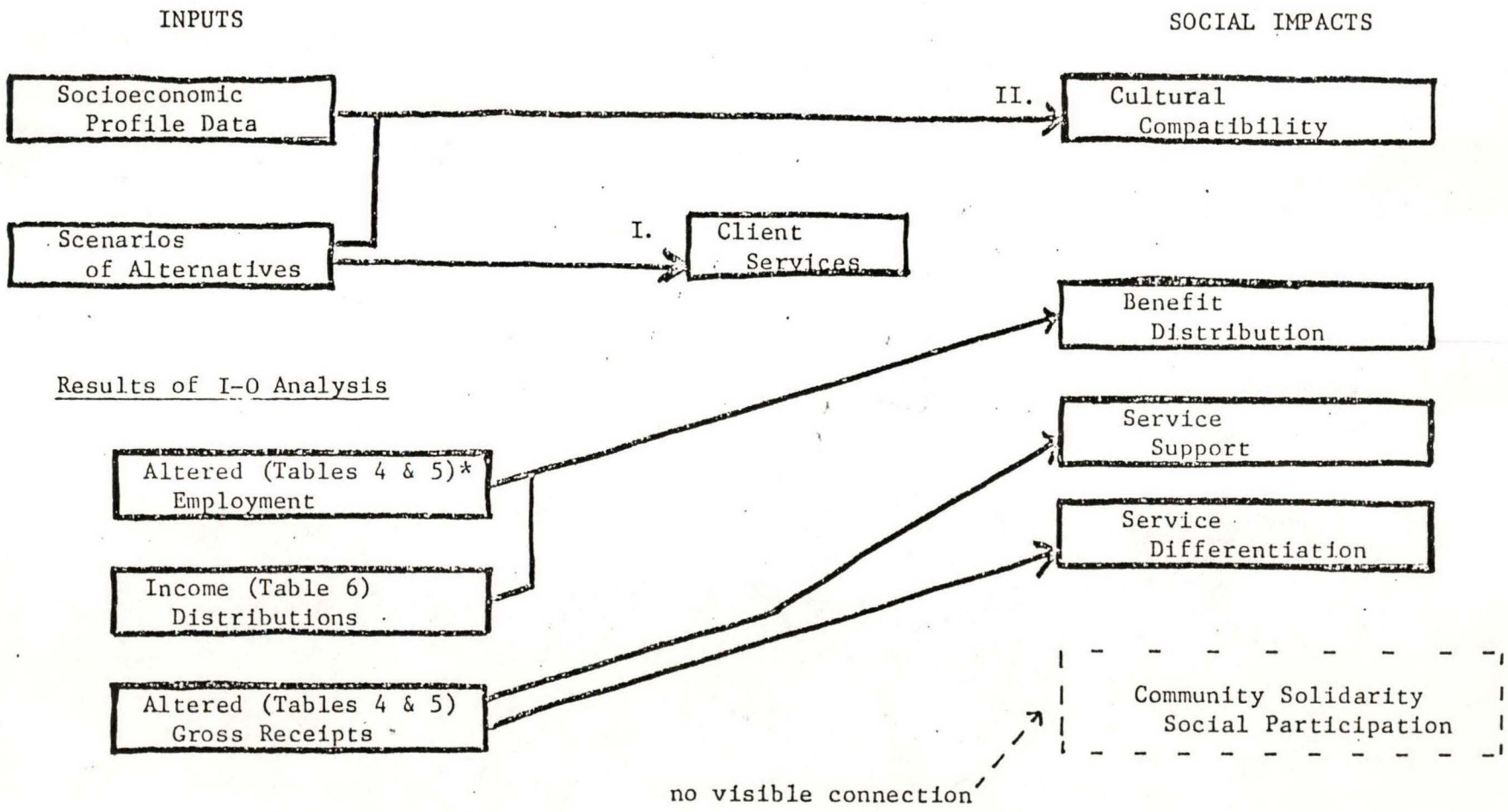
[7] Such estimations must be treated as very tenative. Much more investigation on the relationship between level of economic activity and service differentiation is required before more precise estimates would be possible.

generally get involved in activities. Similarly any new activity which divides the community into two opposing factions would have negative impacts on solidarity. Such impacts, whether positive or negative are likely to occur rather infrequently and then only in one or two communities.

A schematic of the I-O: Social Analysis Model Interface appears in Appendix Figure 2.

Appendix
Figure 2. Schematic of the I-O: Social Analysis Model Interface



*I-O Results keyed to text tables.

ATTACHMENT

The procedures detailed in this report resulted in several sets of tables of basic data. Summaries of these basic data are included in several tables in the body of the report and in the appendices. So that others may use the procedures developed in this report, a complete set of basic tables are included in this attachment. The seven-county coefficients in the original input-output table used to calculate final demand, income and value-added in each community by the 22 sectors, as well as average incomes per man-year by the 22 sectors are all included in Attachment Table 1.

The remaining attachment tables are the summaries of economic impacts for each sector for each of the four community areas. Five sets of tables represent each community area. The first table in each set has the 1977 final demand, total gross output, employment, income, value-added and Type I output multipliers for each sector. The second table in each set represents final demand, total gross output, employment and income for each sector in the extreme alternative plan. The next table in each set represents data for the likely alternative. Table 4 and 5 in each set project final demand, total gross output, employment, income and value-added in 1977 dollars to 1980 and 1990. All of these tables are included as attachment tables (Attachment Tables 2 through 21).

Attachment

Table 1. Coefficients used in Summaries of Economic Impacts, Santa Fe National Forest Social Impact Study, 1977, 1980 and 1990.

Sector	Final Demand (Fin. Dem/ Output)	Income (Inc/ Output)	Value Added (V.A./ Output)	Average Income Per Man Year (Inc/Man Year)
Livestock	.6370	.2240	.2562	5,780
Other Agriculture	.0608	.2390	.4379	4,739
Metal Mining	.8963	.2850	.3297	13,704
Oil and Gas	.9583	.0150	.5729	17,310
Other Mining	.6407	.2570	.5672	13,481
Construction	.9105	.2240	.4413	9,574
Food and Kindred Products	.8833	.0780	.2728	9,001
Textile and Apparel	.7719	.1650	.2946	6,142
Logging	.6294	.1590	.3873	7,645
Sawmills	.6765	.2690	.3426	7,571
Other Wood Products	.2687	.1880	.3934	6,998
Other Manufacturing	.6188	.1870	.3968	10,276
Transport & Warehousing	.5362	.4740	.5839	9,271
Communic. & Utilities	.5804	.4500	.5875	12,364
Wholesale Trade	.7199	.2780	.6648	10,025
Auto and Gas	.9311	.4250	.7643	8,174
Eating and Drinking	.9375	.3140	.7628	3,451
Other Retail	.9190	.4110	.7628	6,497
FIRE	.7052	.1590	.6877	8,340
Lodging	.9735	.5320	.5008	3,961
Personal Services	.8218	.2840	.5903	6,184
Other Services	.7130	.3740	.5883	7,707

Attachment Table 2. Summary of Economic Impacts for the Las Vegas Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand	Total Gross Output	Labor	Income	Value Added	Type I Output Multiplier
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.	1,000 Dol.	
Livestock	5,703.723	8,954.040	347	2,005.705	2,294.025	1,72102
Other Agriculture	44.609	733.696	37	175.353	321.285	1,30233
Metal Mining	1,982.452	2,211.818	46	630.368	729.236	1,22850
Oil and Gas	0	0	0	0	0	1,16339
Other Mining	33.607	52.454	1	13.481	29.752	1,14242
Construction	6,849.160	7,522.416	176	1,685.021	3,319.642	1,23134
Food and Kindred Products	3,567.649	4,039.000	35	285.961	1,101.839	1,37390
Textile and Apparel	0	0	0	0	0	1,07888
Logging	665.796	1,057.826	22	168.194	409.696	1,16282
Sawmills	913.957	1,351.008	48	363.421	462.855	1,50921
Other Wood Products	140.037	521.164	14	97.979	205.026	1,40076
Other Manufacturing	3,230.408	5,220.440	95	976.222	2,071.471	1,20729
Transportation and Warehousing	933.391	1,740.751	89	825.116	1,016.425	1,13441
Communication and Utilities	1,483.077	2,555.268	93	1,149.870	1,501.220	1,15783
Wholesale Trade	1,713.428	2,380.092	66	661.666	1,582.285	1,14555
Auto and Gas	1,898.232	2,038.698	106	866.447	1,558.177	1,11517
Eating and Drinking	1,433.650	1,582.560	144	496.924	1,207.177	1,11655
Other Retail Trade	6,261.375	6,813.248	431	2,800.245	5,197.146	1,11655
FIRE	5,511.699	7,815.795	149	1,242.711	5,374.922	1,18163
Lodging	398.624	409.475	55	217.841	205.065	1,24809
Personal Services	1,377.828	1,676.598	77	476.154	989.696	1,14591
Other Services	4,128.674	5,790.567	281	2,165.672	3,406.591	1,20638
TOTAL	48,381.376	64,466.914	2,312	17,304.351	32,983.531	

Attachment Table 3. Summary of Economic Impacts of Scenario 1 - Extreme Alternative Plan for the Las Vegas Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand 1,000 Dol.	Total Gross Output 1,000 Dol.	Labor Man Years	Income 1,000 Dol.
Livestock				
Other Agriculture				
Metal Mining				
Oil and Gas	1/			
Other Mining				
Construction				
Food and Kindred Products				
Textile and Apparel				
Logging	692.776	1,100.693	23	175.010
Sawmills	1,333.157	1,970.668	70	530.110
Other Wood Products				
Other Manufacturing				
Transportation and Warehousing				
Communication and Utilities				
Wholesale Trade				
Auto and Gas	2,088.502	2,243.048	117	953.295
Eating and Drinking	1,564.970	1,669.301	152	524.161
Other Retail Trade	6,523.025	7,097.960	449	2,917.262
FIRE				
Lodging	411.984	423.199	57	225.142
Personal Services				
Other Services	4,191.654	5,878.898	285	2,198.708
TOTAL	49,437.136	65,807.299	2,378	17,749.295
Change from Present	1,055.760	1,340.385	66	444.944

1/ Sectors that are blank are the same data reported for 1977.

Attachment Table 4. Summary of Economic Impacts of Scenario 2 - Likely Alternative Plan for the Las Vegas Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand	Total Gross Output	Labor	Income
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.
Livestock				
Other Agriculture	1/			
Metal Mining				
Oil and Gas				
Other Mining				
Construction				
Food and Kindred Products				
Textile and Apparel				
Logging	692.776	1,100.693	23	175.010
Sawmills	1,123.557	1,660.838	59	446.766
Other Wood Products				
Other Manufacturing				
Transportation and Warehousing				
Communication and Utilities				
Wholesale Trade				
Auto and Gas	1,931.232	2,074.140	108	881.509
Eating and Drinking	1,494.560	1,594.197	145	500.578
Other Retail Trade	6,303.055	6,858.602	434	2,818.885
FIRE				
Lodging	408.074	419.182	56	223.005
Personal Services				
Other Services	4,144.564	5,812.853	282	2,174.007
TOTAL	48,728.886	64,944.037	2,332	17,445.367
Change	347.510	477.123	20	141.016

1/ Sectors that are blank are the same data reported for 1977.

Attachment Table 5. Summary of Economic Impacts for the Las Vegas Community Area, Santa Fe National Forest Social Impact Study, 1980 (1977 Dollars).

Sector	Final Demand	Total Gross Output	Labor	Income	Value Added
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.	1,000 Dol.
Livestock	6,221.364	9,766.662	347	2,187.732	2,502.219
Other Agriculture	59.000	970.399	37	231.925	424.938
Metal Mining	2,068.646	2,307.984	48	657.775	760.942
Oil and Gas	0	0	0	0	0
Other Mining	33.608	52.455	1	13.481	29.752
Construction	7,238.317	7,949.826	186	1,780.761	3,508.258
Food and Kindred Products	3,771.514	4,269.800	37	333.044	1,164.801
Textile and Apparel	0	0	0	0	0
Logging	756.586	1,202.075	25	191.130	465.564
Sawmills	1,028.202	1,519.884	54	408.849	520.712
Other Wood Products	160.042	595.616	16	111.976	234.315
Other Manufacturing	3,434.434	5,550.152	101	1,037.878	2,202.300
Transportation and Warehousing	985.828	1,838.546	94	871.471	1,073.527
Communication and Utilities	1,562.813	2,692.648	98	1,211.692	1,581.931
Wholesale Trade	1,817.272	2,524.340	70	701.766	1,678.181
Auto and Gas	1,898.232	2,038.698	106	866.447	1,558.177
Eating and Drinking	1,576.378	1,681.470	153	527.982	1,282.625
Other Retail Trade	6,624.564	7,208.448	456	2,962.672	5,498.604
FIRE	5,844.620	8,287.890	158	1,317.774	5,699.582
Lodging	420.367	431.810	58	229.723	216.250
Personal Services	1,538.873	1,872.564	86	531.808	1,105.374
Other Services	4,628.229	6,491.205	315	2,427.711	3,818.776
TOTAL	51,668.889	69,252.472	2,446	18,603.597	35,326.828

Attachment Table 6. Summary of Economic Impacts for the Las Vegas Community Area, Santa Fe National Forest Social Impact Study, 1990 (1977 dollars).

Sector	Final Demand	Total Gross Output	Labor	Income	Value Added
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.	1,000 Dol.
Livestock	6,364.796	9,991.830	355	2,238.170	2,559.907
Other Agriculture	59.000	970.399	37	231.925	424.938
Metal Mining	2,499.614	2,788.814	58	794.812	919.472
Oil and Gas	0	0	0	0	0
Other Mining	336.079	52.455	10	134.809	297.525
Construction	8,639.281	9,488.502	222	2,125.424	4,187.276
Food and Kindred Products	4,485.044	5,077.600	44	396.053	1,385.169
Textile and Apparel	0	0	0	0	0
Logging	756.586	1,202.075	25	191.130	465.564
Sawmills	1,028.202	1,519.884	54	408.849	520.712
Other Wood Products	160.042	595.616	16	111.976	234.315
Other Manufacturing	4,080.516	6,594.240	120	1,233.123	2,616.594
Transportation and Warehousing	1,174.604	2,190.608	112	1,038.348	1,279.096
Communication and Utilities	1,865.807	3,214.692	117	1,446.611	1,888.632
Wholesale Trade	2,154.766	2.993.146	83	832.095	1,989.844
Auto and Gas	1,898.232	2,038.698	106	866.447	1,558.177
Eating and Drinking	1,875.169	2,000.180	182	628.056	1,525.737
Other Retail Trade	7,888.461	8,583.744	543	3,527.919	6,547.680
FIRE	6,954.358	9,861.540	188	1,567.985	6,781.781
Lodging	507.340	521.150	70	277.252	260.992
Personal Services	2,236.734	2,721.750	125	772.977	1,606.649
Other Services	6,714.606	9,417.399	457	3,522.107	5,540.256
TOTAL	61,679.237	81,824.322	2,924	22,346.068	42,590.316

Attachment Table 7. Summary of Economic Impacts for the Santa Fe Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand	Total Gross Output	Labor	Income	Value Added	Type I Output Multiplier
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.	1,000 Dol.	
Livestock	3,568.178	5,601.535	217	1,254.744	1,435.113	1,31900
Other Agriculture	74.838	1,230.893	62	294.183	539.008	1,25802
Metal Mining	7,886.713	8,799.189	183	2,507.769	2,901.093	1,20134
Oil and Gas	0	0	0	0	0	1,20086
Other Mining	907.396	1,416.258	27	363.978	803.302	1,17546
Construction	84,369.195	92,662.488	2,168	20,756.397	40,891.956	1,22789
Food and Kindred Products	8,154.626	9,232.000	80	720.096	2,518.490	1,26911
Textile and Apparel	12,557.085	16,267.762	437	2,684.181	4,792,483	1,28791
Logging	2,814.500	4,471.719	93	711.003	1,731.897	1,09381
Sawmills	818.753	1,210.278	43	325.565	414.641	1,29620
Other Wood Products	560.147	2,084.656	56	391.915	820.104	1,18680
Other Manufacturing	19,654.484	31,762.256	578	5,939.542	12,603.263	1,20827
Transportation and Warehousing	2,957.485	5,515.638	282	2,614.412	3,220.581	1,15965
Communication and Utilities	10,429.384	17,969.304	654	8,086.187	10,556.966	1,18450
Wholesale Trade	7,061.401	9,808.864	272	2,726.864	6,520.933	1,18701
Auto and Gas	16,511.034	17,732.826	922	7,536.451	13,553.199	1,14999
Eating and Drinking	14,290.434	15,243.130	1,387	4,786.343	11,627.460	1,15193
Other Retail Trade	43,364.743	47,186.880	2,985	19,393.808	35,994.152	1,15194
FIRE	49,864.227	70,709.340	1,348	11,242.785	48,626.813	1,23068
Lodging	8,052.203	8,271.395	1,111	4,400.382	4,142.315	1,31615
Personal Services	8,195.394	9,972.492	458	2,832.188	5,886.762	1,15721
Other Services	62,943.917	88,280.388	4,284	33,016.865	51,935.352	1,24167
TOTAL	365,036.137	465,429.291	17,647	132,585.658	261,515.883	-

Attachment Table 8. Summary of Economic Impacts of Scenario 1 - Extreme Alternative Plan on the Santa Fe Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand	Total Gross Output	Labor	Income
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.
Livestock	3,568.247	5,601.644	217	1,254.768
Other Agriculture				
Metal Mining	1/			
Oil and Gas				
Other Mining				
Construction				
Food and Kindred Products				
Textile and Apparel				
Logging	2,976.380	4,728.916	98	751.898
Sawmills	2,285.953	3,379.088	120	908.975
Other Wood Products				
Other Manufacturing				
Transportation and Warehousing				
Communication and Utilities				
Wholesale Trade				
Auto and Gas	17,285.004	18,564.068	965	7,889.729
Eating and Drinking	15,066.504	16,070.938	1,462	5,046.274
Other Retail Trade	45,523.293	49,535.683	3,134	20,359.166
FIRE				
Lodging	9,525,313	9,784.605	1,314	5,205.410
Personal Services				
Other Services	63,069.326	88,456.278	4,293	33,082.648
TOTAL	371,972.395	473,552.360	18,208	135,659.365
Change	6,936.258	8,123.069	561	3,073.707

1/ Sectors that are blank are the same data reported for 1977.

Attachment Table 9. Summary of Economic Impacts of Scenario 2 - Likely Alternative Plan on the Santa Fe Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand	Total Gross Output	Labor	Income
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.
Livestock	3,568.247	5,601.643	217	1,254.768
Other Agriculture				
Metal Mining	1/			
Oil and Gas				
Other Mining				
Construction				
Food and Kindred Products				
Textile and Apparel				
Logging				
Sawmills	2,868.460	4,557.452	95	724.635
Other Wood Products	1,552.353	2,294.683	82	617.270
Other Manufacturing				
Transportation and Warehousing				
Communication and Utilities				
Wholesale Trade				
Auto and Gas	16,809.304	18,053.167	939	7,672.596
Eating and Drinking	14,582.969	15,555.167	1,415	4,884.322
Other Retail Trade	43,989.553	47,866.761	3,028	19,673.239
FIRE				
Lodging	8,261.858	8,486.757	1,140	4,514.955
Personal Services				
Other Services	62,984.250	88,336.957	4,287	33,038.022
TOTAL	367,289.369	468,183.727	17,808	133,540.304
Change from Present	2,253.232	2,754.436	161	954.646

1/ Sectors that are blank are the same data reported for 1977.

Attachment Table 10. Summary of Economic Impacts for the Santa Fe Community Area, Santa Fe National Forest Social Impact Study, 1980 (1977 dollars).

Sector	Final Demand	Total Gross Output	Labor	Income	Value Added
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.	1,000 Dol.
Livestock	2,868.640	4,503.360	174	1,008.753	1,153.761
Other Agriculture	106.838	1,757.209	89	419.973	769.482
Metal Mining	8,490.068	9,472.351	197	2,699.620	3,123.034
Oil and Gas	0	0	0	0	0
Other Mining	974.630	1,521.195	29	390.947	862.822
Construction	90,595.704	99,501.048	2,328	22,288.235	43,909.812
Food and Kindred Products	8,766.222	9,924.400	86	702.648	2,707.376
Textile and Apparel	13,476.598	17,458.994	469	2,880.734	5,143.420
Logging	3,147.398	5,000.632	104	795.100	1,936.745
Sawmills	913.957	1,351.008	48	363.421	462.855
Other Wood Products	630.166	2,345.238	63	440.905	922.617
Other Manufacturing	21,116.669	34,125.192	621	6,381.411	13,540.876
Transportation and Warehousing	3,177.723	5,926.377	303	2,809.103	3,460.412
Communication and Utilities	11,194.843	19,288.152	702	8,679.668	11,331.789
Wholesale Trade	7,580.622	10,530.104	292	2,927.369	7,000.413
Auto and Gas	16,511.034	17,732.826	922	7,536.451	13,553.199
Eating and Drinking	15,351.656	16,375.100	1,490	5,141.781	12,490.926
Other Retail Trade	46,575.332	50,680.448	3,206	20,829.664	38,659.046
FIRE	53,563.353	75,954.840	1,448	12,076.820	52,234.144
Lodging	8,646.515	8,881.885	1,193	4,725.163	4,448.048
Personal Services	8,929.043	10,865.226	499	3,085.724	6,413.743
Other Services	68,615.334	96,234.690	4,670	35,991.774	56,614.868
TOTAL	391,232.345	499,430.275	18,933	142,175.264	280,739.388

Attachment Table 11. Summary of Economic Impacts for the Santa Fe Community Area, Santa Fe National Forest Social Impact Study, 1990 (1977 Dollars.)

Sector	Final Demand	Total Gross Output	Labor	Income	Value Added
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.	1,000 Dol.
Livestock	2,940.356	4,615.944	179	1,033.972	1,182.605
Other Agriculture	106.838	1,757.209	89	419.973	769.482
Metal Mining	10,515.618	11,732.252	244	3,343.692	3,868.124
Oil and Gas	0	0	0	0	0
Other Mining	1,209.885	1,888.380	36	483.314	1,071.089
Construction	112,388.485	123,436.008	2,888	27,649.666	54,472.310
Food and Kindred Products	10,804.879	12,232.400	106	866.054	3,336.999
Textile and Apparel	16,723.624	21,665.532	582	3,574.813	6,382.666
Logging	3,147.398	5,000.632	104	795.101	1,936.745
Sawmills	913.957	1,351.008	48	363.421	462.855
Other Wood Products	630.166	2,345.238	63	440.905	922.617
Other Manufacturing	26,183.309	42,313.040	770	7,912.538	16,789.814
Transportation and Warehousing	3,943.314	7,354.184	376	3,485.883	4,294.108
Communication and Utilities	13,889.898	23,931.596	871	10,769.218	14,059.813
Wholesale Trade	9,397.894	13,054.444	362	3,629.135	8,678.594
Auto and Gas	16,511.034	17,732.826	922	7,536.451	13,553.199
Eating and Drinking	19,029.872	20,298.530	1,847	6,373.738	15,483.718
Other Retail Trade	57,761.547	62,852.608	3,976	25,832.422	47,943.969
FIRE	66,436.314	94,209.180	1,796	14,979.260	64,787.653
Lodging	10,726.607	11,018.600	1,480	5,861.895	5,518.115
Personal Services	11,631.018	14,153.100	650	4,019.480	8,354.575
Other Services	89,405.633	125,393.595	6,085	46,897.204	73,769.052
TOTAL	484,297.646	618,336.306	23,474	176,268.135	347,638.102

Attachment Table 12. Summary of Economic Impacts for the Espanola Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand 1,000 Dol.	Total Gross Output 1,000 Dol.	Labor Man Years	Income 1,000 Dol.	Value Added 1,000 Dol.	Type I Output Multiplier
Livestock	822.250	1,290.817	50	289.143	330.707	1,62597
Other Agriculture	39.183	315.504	16	75.406	138.159	1,31349
Metal Mining	1,249.807	1,394.407	29	397.406	459.736	1,21839
Oil and Gas	2,322.344	2,423.400	2	36.351	1,388.366	1,19577
Other Mining	33.607	52.454	1	13.481	29.752	1,17309
Construction	6,460.003	7,095.006	166	1,589.281	3,131.026	1,27284
Food and Kindred Products	1,121.261	1,269.400	11	99.013	346.292	1,36270
Textile and Apparel	1,350.533	1,749.622	47	288.688	515.439	1,30497
Logging	1,301.328	2,067.569	43	328.744	800.770	1,17212
Sawmills	666.427	985.110	35	264.995	377.499	1,52345
Other Wood Products	60.016	223.356	6	41.991	87.868	1,41804
Other Manufacturing	3,094.404	5,000.652	91	935.122	1,984.259	1,24632
Transportation and Warehousing	272.676	508.534	26	241.045	296.933	1,14577
Communication and Utilities	1,722.284	2,967.408	108	1,335.334	1,743.352	1,20489
Wholesale Trade	1,116.325	1,550.666	43	431.085	1,030.883	1,18922
Auto and Gas	1,916.140	2,057.931	107	874.621	1,572.877	1,14693
Eating and Drinking	1,195.163	1,274.840	116	400.300	972.448	1,14842
Other Retail Trade	5,084.643	5,532.800	350	2,273.981	4,220.420	1,14842
FIRE	4,993.821	7,081.425	135	1,125.947	4,869.896	1,21759
Lodging	507.340	521.150	70	277.252	260.992	1,30364
Personal Services	984.163	1,197.570	55	340.110	706.926	1,16924
Other Services	6,934.997	9,726.504	472	3,637.712	5,722.102	1,25833
TOTAL	43,228.715	56,285.125	1,979	15,297.008	30,986.702	

Attachment Table 13. Summary of Economic Impacts of Scenario 1 - Extreme Alternative Plan on the Española Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand	Total Gross Output	Labor	Income
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.
Livestock	1/			
Other Agriculture				
Metal Mining				
Oil and Gas				
Other Mining				
Construction				
Food and Kindred Products				
Textile and Apparel				
Logging	1,571.128	2,496.231	52	396.901
Sawmills	1,588.667	2,348.362	83	631.709
Other Wood Products				
Other Manufacturing				
Transportation and Warehousing				
Communication and Utilities				
Wholesale Trade				
Auto and Gas	2,309.897	2,480.826	129	1,054.351
Eating and Drinking	1,368.157	1,459.367	133	458.241
Other Retail Trade	5,627.781	6,123.809	387	2,516.886
FIRE				
Lodging	549.552	564.512	76	300.320
Personal Services				
Other Services	7,049.063	9,886.484	480	3,697.545
TOTAL	45,686.922	59,478.812	2,126	16,295.356
Change from present	2,458.207	3,193.687	147	998.348

1/ Data that are blank are the same data reported for 1977.

Attachment Table 14. Summary of Economic Impacts of Scenario 2 - Likely Alternative Plan on the Española Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand	Total Gross Output	Labor	Income
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.
Livestock	822.282	1,290.866	50	289.154
Other Agriculture				
Metal Mining	1/			
Oil and Gas				
Other Mining				
Construction				
Food and Kindred Products				
Textile and Apparel				
Logging	1,468.604	2,333.340	49	371.001
Sawmills	1,022.747	1,511.821	54	406.680
Other Wood Products				
Other Manufacturing				
Transportation and Warehousing				
Communication and Utilities				
Wholesale Trade				
Auto and Gas	1,983.613	2,130.397	111	905.419
Eating and Drinking	1,218.670	1,299.915	118	408.173
Other Retail Trade	5,185.433	5,642.473	357	2,319.057
FIRE				
Lodging	542.098	556.855	75	296.247
Personal Services				
Other Services	6,965.390	9,769.130	474	3,653.655
TOTAL	44,009.264	57,633.201	2,024	15,599.646
Change from Present	780.549	1,348.076	45	302.638

1/ Data that are blank are the same data reported for 1977.

Attachment Table 15. Summary of Economic Impacts for the Española Community Area, Santa Fe National Forest Social Impact Study, 1980 (1977 Dollars).

Sector	Final Demand	Total Gross Output	Labor	Income	Value Added
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.	1,000 Dol.
Livestock	1,757.042	2,758.308	107	617.861	706.678
Other Agriculture	43.054	708.129	36	169.243	310.090
Metal Mining	1,292.904	1,442.490	30	411.110	475.589
Oil and Gas	2,211.756	2,308.000	2	34.620	1,322.253
Other Mining	33.608	52.455	1	13.481	29.752
Construction	6,576.750	7,223.229	169	1,618.003	3,187.611
Food and Kindred Products	1,121.261	1,269.400	11	99.013	346.292
Textile and Apparel	1,379.268	1,786.848	48	294.830	526.405
Logging	1,449.498	2,302.984	48	366.174	891.946
Sawmills	742.590	1,097.694	39	295.280	376.070
Other Wood Products	70.018	260.582	7	48.989	102.513
Other Manufacturing	3,162.400	5,110.536	93	955.670	2,027.861
Transportation and Warehousing	272.676	508.534	26	241.045	296.933
Communication and Utilities	1,754.178	3,022.360	110	1,360.062	1,775.636
Wholesale Trade	1,142.286	1,586.728	44	441.110	1,054.857
Auto and Gas	1,916.140	2,057.931	107	874.621	1,572.877
Eating and Drinking	1,215.769	1,296.820	118	407.202	989.214
Other Retail Trade	5,171.808	5,627.648	356	2,312.963	4,292.770
FIRE	5,067.803	7,186.335	137	1,142.627	4,942.043
Lodging	514.587	528.595	71	281.212	264.720
Personal Services	1,002.057	1,219.344	56	346.294	719.779
Other Services	6,993.768	9,808.932	476	3,668.541	5,770.595
TOTAL	44,891.221	59,163.882	2,092	15,999.951	31,982.484

Attachment Table 16. Summary of Economic Impacts for the Espanola Community Area, Santa Fe National Forest Social Impact Study, 1990 (1977 Dollars).

Sector	Final Demand	Total Gross Output	Labor	Income	Value Added
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.	1,000 Dol.
Livestock	1,792.900	2,814.600	109	630.470	721.100
Other Agriculture	43.054	708.129	36	169.243	310.090
Metal Mining	1,422.194	1,586.739	33	452.221	523.148
Oil and Gas	2,211.756	2,308.000	2	34.620	1,322.253
Other Mining	33.608	52.455	1	13.481	29.753
Construction	7,432.895	8,163.531	191	1,828.631	3,602.566
Food and Kindred Products	1,325.127	1,500.200	13	117.016	409.255
Textile and Apparel	1,551.676	2,010.204	54	331.684	592.206
Logging	1,452.645	2,307.984	48	366.970	893.882
Sawmills	742.590	1,097.694	39	295.280	376.070
Other Wood Products	70.018	260.582	7	48.989	102.513
Other Manufacturing	3,570.451	5,769.960	105	1,078.983	2,289.520
Transportation and Warehousing	314.626	586.770	30	278.129	342.615
Communication and Utilities	1,977.437	3,407.024	124	1,533.161	2,001.627
Wholesale Trade	1,272.091	1,767.038	49	491.237	1,174.727
Auto and Gas	1,916.140	2,057.931	107	874.621	1,572.877
Eating and Drinking	1,370.316	1,461.670	133	458.964	1,114.962
Other Retail Trade	5,840.076	6,354.816	402	2,611.829	4,847.454
FIRE	5,733.646	8,130.525	155	1,292.754	5,591.362
Lodging	579.817	595.600	80	316.859	298.276
Personal Services	1,198.890	1,458.858	67	414.316	861.164
Other Services	8,448.355	11,849.025	575	4,431.535	6,970.781
TOTAL	50,300.308	66,249.335	2,360	18,070.992	35,948.201

Attachment Table 17. Summary of Economic Impacts for the (Cuba) Community Area, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand 1,000 Dol.	Total Gross Output 1,000 Dol.	Labor Man Years	Income 1,000 Dol.	Value Added 1,000 Dol.	Type I Output Multiplier
Livestock	856.508	1,344.597	52	301.190	344.486	1,72508
Other Agriculture	24.695	406.161	20	97.072	177.858	1,32457
Metal Mining	344.774	384.664	8	109.629	126.824	1,18961
Oil and Gas	4,423.513	4,616.000	4	69.240	2,644.506	1,22718
Other Mining	0	0	0	0	0	1,15795
Construction	3,035.423	3,333.798	78	746.771	1,471.205	1,24430
Food and Kindred Products	203.866	230.800	2	18.002	62.962	1,33643
Textile and Apparel	143.673	186.130	5	30.711	54.834	1,17140
Logging	726.323	1,153.992	24	183.485	446.941	1,16632
Sawmills	456.979	675.504	24	181.711	231.428	1,51818
Other Wood Products	20.005	74.452	2	13.997	29.289	1,41201
Other Manufacturing	2,686.340	4,341.208	79	811.806	1,722.591	1,23384
Transportation and Warehousing	125.850	234.708	12	111.252	137.046	1,15045
Communication and Utilities	542.200	934.184	34	420.383	548.833	1,23461
Wholesale Trade	311.532	432.744	12	120.303	287.688	1,16053
Auto and Gas	429.788	461.592	24	196.177	352.795	1,13328
Eating and Drinking	381.216	406.630	37	127.682	310.177	1,13530
Other Retail Trade	1,016.929	1,106.560	70	454.796	844.084	1,13531
FIRE	2,330.450	3,304.665	63	525.442	2,272.618	1,22183
Lodging	130.459	134.010	18	71.293	67.112	1,27894
Personal Services	143.151	174.192	8	49.470	102.826	1,15533
Other Services	1,513.358	2,122.521	103	792.823	1,248.679	1,23694
TOTAL	19,847.032	26,059.112	679	5,433.235	13,484.782	

Attachment Table 18. Summary of Economic Impacts of Scenario 1 - Extreme Alternative Plan on the (Cuba) Community, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand 1,000 Dol.	Total Gross Output 1,000 Dol.	Labor Man Years	Income 1,000 Dol.
Livestock				
Other Agriculture	1/			
Metal Mining				
Oil and Gas				
Other Mining				
Construction				
Food and Kindred Products				
Textile and Apparel				
Logging	979.785	1,556.697	32	247.515
Sawmills	1,085.779	1,604.995	57	431.744
Other Wood Products				
Other Manufacturing				
Transportation and Warehousing				
Communication and Utilities				
Wholesale Trade				
Auto and Gas	741.231	796.081	41	338.334
Eating and Drinking	578.578	617.150	56	193.785
Other Retail Trade	1,492.195	1,623.716	103	667.347
FIRE				
Lodging	159.255	163.590	22	87.030
Personal Services				
Other Services	1,594.236	2,235.955	109	836.247
TOTAL	21,823.039	28,596.487	799	6,227.270
Change from Present	1,976.007	2,537.375	120	794.035

1/ Data that are blank are the same data reported for 1977.

Attachment Table 19. Summary of Economic Impacts of Scenario 2 - Likely Alternative Plan on the (Cuba) Community, Santa Fe National Forest Social Impact Study, 1977.

Sector	Final Demand	Total Gross Output	Labor	Income
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.
Livestock	856.540	1,344.647	52	301.201
Other Agriculture	1/			
Metal Mining				
Oil and Gas				
Other Mining				
Construction				
Food and Kindred Products				
Textile and Apparel				
Logging	861.223	1,368.324	28	217.563
Sawmills	855.219	1,264.182	45	340.065
Other Wood Products				
Other Manufacturing				
Transportation and Warehousing				
Communication and Utilities				
Wholesale Trade				
Auto and Gas	510.631	548.417	29	233.077
Eating and Drinking	450.684	480.730	44	150.949
Other Retail Trade	1,161.171	1,263.516	80	519.305
FIRE				
Lodging	150.620	154.720	21	82.311
Personal Services				
Other Services	1,537.247	2,156.027	105	806.354
TOTAL	20,718.807	27,234.269	731	5,774.903
Change from Present	871.775	1,175.157	52	341.668

1/ Data that are blank are the same data reported for 1977.

Attachment Table 20. Summary of Economic Impacts for the (Cuba) Community Area, Santa Fe National Forest Social Impact Study, 1980 (1977 Dollars).

Sector	Final Demand 1,000 Dol.	Total Gross Output 1,000 Dol.	Labor Man Years	Income 1,000 Dol.	Value Added 1,000 Dol.
Livestock	591.657	928.818	36	208.055	237.963
Other Agriculture	19.135	314.724	16	75.219	137.818
Metal Mining	430.968	480.830	10	137.037	158.530
Oil and Gas	5,529.391	5,770.000	5	86.550	3,305.633
Other Mining	0	0	0	0	0
Construction	3,774.821	4,145.877	97	928.676	1,829.576
Food and Kindred Products	203.866	230.800	2	18.002	62.962
Textile and Apparel	172.408	223.356	6	36.854	65.801
Logging	817.113	1,298.241	27	206.420	502.809
Sawmills	514.101	759.942	27	204.424	260.356
Other Wood Products	20.005	74.452	2	13.997	29.289
Other Manufacturing	3,332.421	5,385.296	98	1,007.050	2,136.886
Transportation and Warehousing	157.313	293.385	15	139.064	171.307
Communication and Utilities	669.777	1,153.992	42	519.296	677.970
Wholesale Trade	389.416	540.930	15	150.378	359.610
Auto and Gas	429.788	461.592	24	196.177	352.795
Eating and Drinking	473.944	505.540	46	158.740	385.626
Other Retail Trade	1,263.897	1,375.296	87	565.247	1,049.076
FIRE	2,885.319	4,091.490	78	650.547	2,813.718
Lodging	159.450	163.790	22	87.136	82.026
Personal Services	214.726	261.288	12	74.206	154.238
Other Services	2,203.919	3,091.050	150	1,156.053	1,818.465
TOTAL	24,253.435	31,550.689	817	6,619.128	16,592.454

Attachment Table 21. Summary of Economic Impacts for the (Cuba) Community Area, Santa Fe National Forest Social Impact Study, 1990 (1977 Dollars).

Sector	Final Demand	Total Gross Output	Labor	Income	Value Added
	1,000 Dol.	1,000 Dol.	Man Years	1,000 Dol.	1,000 Dol.
Livestock	609.586	956.964	37	214.360	245.174
Other Agriculture	19.135	314.724	16	75.219	137.818
Metal Mining	517.162	576.996	12	164.444	190.236
Oil and Gas	6,635.269	6,924.000	6	103.860	3,966.760
Other Mining	0	0	0	0	0
Construction	4,669.882	5,128.920	120	1,148.878	2,263.392
Food and Kindred Products	305.798	346.200	3	27.004	94.443
Textile and Apparel	229.878	297.808	8	49.138	87.734
Logging	817.113	1,298.241	27	206.420	502.809
Sawmills	514.101	759.942	27	204.424	260.356
Other Wood Products	20.005	74.452	2	13.997	29.289
Other Manufacturing	4,114.520	6,649.192	121	1,243.399	2,638.399
Transportation and Warehousing	199.263	371.621	19	176.148	216.990
Communication and Utilities	829.248	1,428.752	52	642.938	839.392
Wholesale Trade	493.260	685.178	19	190.480	455.506
Auto and Gas	429.788	461.592	24	196.177	352.795
Eating and Drinking	587.278	626.430	57	196.699	477.841
Other Retail Trade	1,568.977	1,707.264	108	701.686	1,302.301
FIRE	3,588.153	5,088.135	97	809.014	3,499.110
Lodging	202.936	208.460	28	110.901	104.397
Personal Services	304.196	370.158	17	105.125	218.504
Other Services	3,114.872	4,368.684	212	1,633.888	2,570.097
TOTAL	29,770.420	38,643.713	1,012	8,214.199	20,453.343